

THE IRON AGE

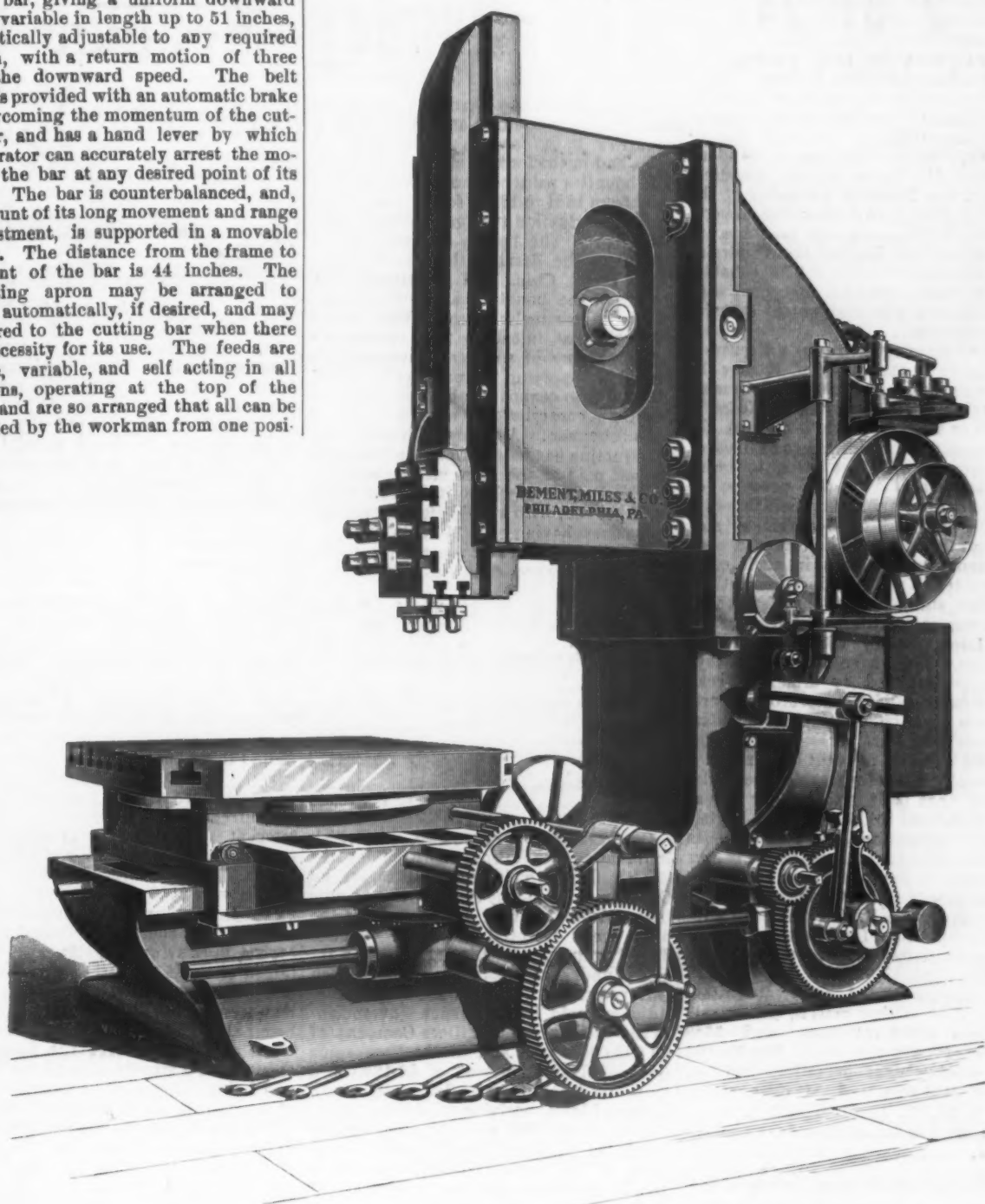
THURSDAY, APRIL 20, 1893.

Bement, Miles & Co.'s 48-inch Slotting Machine.

The 48 inch slotting machine, built by Bement, Miles & Co. of Philadelphia, is driven by reversing pulleys through a train of powerful gearing to a rack on the cutting bar, giving a uniform downward stroke, variable in length up to 51 inches, and vertically adjustable to any required position, with a return motion of three times the downward speed. The belt shifter is provided with an automatic brake for overcoming the momentum of the cutting bar, and has a hand lever by which the operator can accurately arrest the motion of the bar at any desired point of its stroke. The bar is counterbalanced, and, on account of its long movement and range of adjustment, is supported in a movable bearing. The distance from the frame to the front of the bar is 44 inches. The tool-lifting apron may be arranged to operate automatically, if desired, and may be secured to the cutting bar when there is no necessity for its use. The feeds are positive, variable, and self acting in all directions, operating at the top of the stroke, and are so arranged that all can be controlled by the workman from one posi-

to the city of Seattle, and utilizing it for running the machinery of the capital of Washington State. Snoqualmie Falls are formed by the descent of the Snoqualmie River over a precipice 268 feet high into a gorge which broadens out into a fertile valley. The falls are 55 miles from Seattle

that even when it is at its lowest, in mid-summer, enough power will be obtainable to turn every wheel in Seattle, and to supply light and heat when the city shall have grown to ten times its present size. It is also intended to utilize the power for the hoisting engines of neighboring coal



BEMENT, MILES & CO.'S 48-INCH SLOTTING MACHINE.

tion. The compound tables have an adjustment of 60 inches in each direction by hand by automatic feeds, or rapidly by power, and support a revolving rectangular table 54 inches in diameter (68 inches across the corners), which may be fixed in position by corner clamps when the circular feed is not in use.

A Western mining journal states that plans are in course of execution for transmitting the power of the Snoqualmie Falls

by the Seattle, Lake Shore & Eastern Railroad, but in a straight line they are but 18 miles distant. They are one of the favorite Puget Sound pleasure resorts. Wealthy local magnates are said to have joined in the project and to have acquired the land on either side of the falls for the purpose of erecting the necessary works. The initial plant, which, it is said, will be in operation within six months, will generate 5000 horse-power. Although the capacity of the falls varies according to the volume of water in the river, it is declared

mines, haulage of logs in the forest and even for lighting the farm houses along the route of the cable.

At a meeting held by the committee appointed to inquire into the most suitable site for the great International Exhibition to be held in Paris in the year 1900, the Champs de Mars was chosen. It is proposed that all the fetes and grand demonstrations shall be held in the neighboring wood of Vincennes. Preparations are al-

ready actively going on for this exhibition, which is to bring the nineteenth century to an end in a blaze of glory for the Parisians, provided nothing in the nature of a revolution, or other inconvenient incident, occurs meanwhile to disturb their plans.

Merchant Cruisers and Government Subsidies.

At the meeting of the Institution of Naval Architects held recently in England an important paper on "Merchant Cruisers," considered with reference to the policy of maintaining a reserve of vessels by the payment of Government subventions, was read by Lord Brassey, the president elect of the society. Lord Brassey's thorough familiarity with naval and maritime matters is universally recognized. The "Naval Annual," bearing his name, is regarded as a standard authority. He is an expert, practical navigator, was formerly a member of the Admiralty Board, and after the Liberal party came into power last year his appointment as First Lord of the Admiralty was for a time regarded as not improbable. His views on any subject connected with nautical affairs are at least worthy of careful consideration.

Without entering here into a discussion of the merits of the question, it may be stated in general terms that Lord Brassey believes the system of paying subsidies, in one form or another, with a view to the establishment and maintenance of lines of steamships of the highest class, to be so firmly established by the practice of maritime nations that even British ship-owners, if deprived of Government aid, would find it impossible to compete with vessels under foreign flags in such commerce as tends to the development of steamships suitable for employment in time of war as auxiliary armed cruisers. While Lord Brassey admits that mail steamships, which have large hatchways and are not protected by armored decks and by minute subdivision into compartments, can never be a match for regular-built vessels of war, yet he claims that for certain services mercantile auxiliaries would be absolutely invaluable. He holds, therefore, that it is essential for Great Britain to adhere to the policy of paying Admiralty subventions, and even suggests that in addition to such payments it may be necessary in the future to increase the subsidies now in force for the conveyance of mails under the British flag. In supporting his position, Lord Brassey presents an array of statistics and data of much interest.

The tonnage owned by Great Britain includes 9506 sailing vessels, collectively measuring 3 602,546 tons, and 5598 steamers, of 8 912,522 tons. The United States, coming next in sailing tonnage, can show 3428 vessels of this class, aggregating 1,166,963 tons. Germany, which stands second in steam tonnage, owns 765 steamers, aggregating 1,091,472 tons. Broadly, it may be said that England owns half the mercantile tonnage of the world. Considering more in detail the ships which would assume a new importance in time of war, and which in peace serve for the conveyance of mails and passengers, it is stated that according to the latest returns published by the Bureau Veritas the merchant navies of the world possess 45 steamers, each exceeding 6000 tons. Of these 10 are French, 1 is Belgian, 7 are German and 27 are English. Of the 10 largest steamships of the world 7 are British. Of the 14 ocean steamers of 19 knots speed and above engaged in the Atlantic trade 6 are British, 5 are German, 2 now belong to the United States and 1 flies the French flag. Lord Brassey expresses the opinion that, owing to the large subsidies they enjoy, mail steam-

ers sailing under other flags are running a closer race every year with British lines of ocean steamers.

The subsidies paid annually for ocean mail service conducted under their national flag by leading maritime nations are as follows:

France.....	\$5,071,000
Germany.....	4,860,000
Russia.....	2,187,000
Italy.....	1,944,000
Great Britain.....	3,232,000

The total annual foreign trade of these nations may be stated approximately as follows:

France.....	\$1,458,000,000
Germany.....	1,521,000,000
Russia.....	539,000,000
Italy.....	885,000,000
Great Britain.....	3,596,000,000

In addition to the payments under the mail contracts bounties are paid in several countries both for the construction of ships and in the form of mileage subsidies. The bounties paid by the French Government from 1881 to 1890, for the encouragement of navigation averaged about \$1,448,000 a year. The bounty-earning services extend to the Brazils, the River Plate, New York, China and the Pacific. A feature of the bounty system which commends it particularly to French naval officers is that in calling into existence a large number of steamers a means is afforded of supplying the navy with skilled firemen, who cannot be obtained from the maritime conscription, recruited mainly from fishermen. A policy of bounties on construction has been adopted in Italy, the amount paid on the gross measurement of iron and steel vessels built in Italy being \$9.72 per ton, with an additional premium on steamers having over 14 knots speed.

The leading lines of steamships under European flags are enumerated in the following list:

Name of Company.	No. of Steamers.	Aggregate tons.
British India.....	103	240,000
Peninsular & Oriental.....	36	216,000
Messageries Maritimes.....	61	202,000
North German Lloyd.....	66	197,000
Navigazione Generale.....	106	170,000
Compagnie Générale Transatlantique.....	66	167,000
Hamburg American.....	86	165,000
Wilson.....	86	158,000
Austrian Lloyd's.....	73	128,000
White Star.....	20	96,000
Cunard.....	26	86,000

Of these lines there are two, the British India and the Wilson, both under the British flag, which receive little or no Government aid; but it is worthy of note that neither of them has vessels of the high speed essential for armed cruisers. The Peninsular & Oriental Company receive, under contracts with the British Government, \$1,652,000 annually. Subsidies are paid by the French Government to the Messageries Maritimes Company of \$2,692,000 a year, and to the Compagnie Générale Transatlantique of \$2,169,000 a year. Under the German flag are the North German Lloyd, receiving subsidies amounting to \$1,069,000 annually, for services extending to Shanghai, Australia and all parts of the Mediterranean, with speeds on the Eastern routes not exceeding 12 knots, and the Hamburg American Company, receiving a subsidy based on services rendered, but the exact amount of which is not stated. The Navigazione Generale, under the Italian flag, receives subsidies amounting to \$1,846,000 a year. The subsidies paid the Austrian Lloyd aggregate \$632,000. The White Star and the Cunard companies receive Admiralty subventions, and also receive pay for mail service under their contracts. The "Teutonic" and the "Majestic" each receive on the average, per voyage, a little over \$3000 from the Admiralty and nearly \$5000 from the British post office authorities. Since their transfer to the American flag the "Paris" and the "New York" of the new American line should each receive

under their present mail contract, according to Lord Brassey's estimate, about \$12,000 per voyage; but it is stipulated that their owners shall have additional vessels of high speed built in the United States.

The concluding portion of Lord Brassey's paper presents the view that the policy which he advocates tends to improve the means of communication between the British colonies and the mother country, thereby leading to a closer union, a result which he regards as of the utmost importance.

The Taussig System of Smelting and Casting Metals.

The Taussig system of smelting and casting metals in exhausted chambers, to which we referred in a note lately, was explained recently at Sheffield, England, by George A. Pogson, British Vice-Consul at Hamburg, to a number of persons interested in the subject. According to a report in a Sheffield journal, we glean the following description of the iron furnace seen by Mr. Pogson at Professor Taussig's works at Bahrenfeld, which consisted of a rectangular vessel 6 feet by 3 feet by 3 feet. Two electrodes, apparently of wrought iron, were placed upright inside the furnace so that their surfaces of 8 inches by 4 inches faced the arc-shaped piece of iron which was to be fused; a channel of clay served the purpose of conducting the fused metal from its clay melting bed into the empty clay mold of a model propeller, the mold in question being placed at a lower point in the otherwise empty iron furnace. The wires connecting the flat metal electrodes with the generating machinery were already in position, as was also the exhaust pipe connecting the furnace with a steam air pump of about 20 horse power, which also drove the dynamos. The 30 pounds of pig iron in the clay bed having been placed parallel with, but a few inches in front of, the flat electrodes, the cover of the oven was swung on, the necessary exclusion of external air being effected by india rubber pads fastened to the furnace cover. Punctually at noon the cover was fastened down and the pump set working, the currents being switched on at the same moment. The indicator or exhaust pump soon showed an exhaustion of 92 per cent. of air. The electric indicators showed respectively 2500 to 3000 amperes and 2 to 2½ volts. The gradual approach from red to white heat could be followed from the eyelets in the furnace. Fusion was obtained at about 12.8, the indicators showing great unsteadiness until the resistance had been reduced to nil by the current being allowed to pass freely through the fused metal. At 12.14 the furnace was opened and a minute or two later the clay was being chipped off and the perfect cast of a propeller was exposed to view.

It is stated that the expenditure of coal in this process is at most but 50 per cent. of that necessitated by the most perfect system at present in use. It is also claimed that by the use of metallic electrodes all contamination of metal by carbon is absolutely avoided, and oxidation and creation of air bubbles are, it is contended, by this new method of smelting in a vacuum, also avoided. Bronze, iron, steel, copper, brass, zinc, platinum, gold and silver have been successfully cast free from pores and bubbles by the Taussig process, the average expenditure of coal being 360 hundredweight per 1000 hundredweight of finished cast metal.

It is stated that numerous samples of these castings have been tested in the proof rooms of the Royal Technical School at Charlottenburg, near Berlin, and the Government reports of the tests show the most satisfactory results.

The Tebbetts Rolled Forging Machine.

Until a comparatively recent date roll forgings have been made almost exclusively by means of a type of machine which carries a pair of straight dies forward and back without deviation to the right or left. Such machines are limited in their rate of production for the evident reason that considerable time is lost during the necessarily idle return motion of the dies.

still just as truly in a straight line as before. Again, in a machine of that description, the dies travel past each other at different speeds, for one is on the outer edge of a disk and the other on the inner surface of what is practically a hoop. Thus the latter progresses at a higher rate of speed than the former, an action which tends toward an uneven working of the metal.

It is not generally known that there is a machine that aims to overcome these

machines in a well equipped factory which has been located at South Framingham, Mass., in order to take advantage of the water gas to be obtained there. It supplies them with fuel for heating the rods, with power and with light. Although but recently established, the company already have several of their machines constantly at work filling orders. Incidentally it may be stated that the business of the Enterprise Mfg. Company is not to sell machines, but to manufacture roll-forgings of every description. This company have, however, the entire control of the patents, and the roll forging business under this process will be conducted exclusively by them.

Many articles which are now being drop-forged could be more cheaply made and of a better quality, by this method. From the nature of the process, it is confined to the production of articles of a circular, or nearly circular, cross section. By means of special dies such shapes as hexagon-head cap-screws, piano pins, &c., can be successfully rolled.

The accompanying diagram and view in perspective are self-explanatory. Fig. 1 represents the outlines of three sets of dies as they lie upon the circular tables. One set is in a position as if just beginning to roll an article from the extremity of the bar shown, which is guided into position by suitable rests.

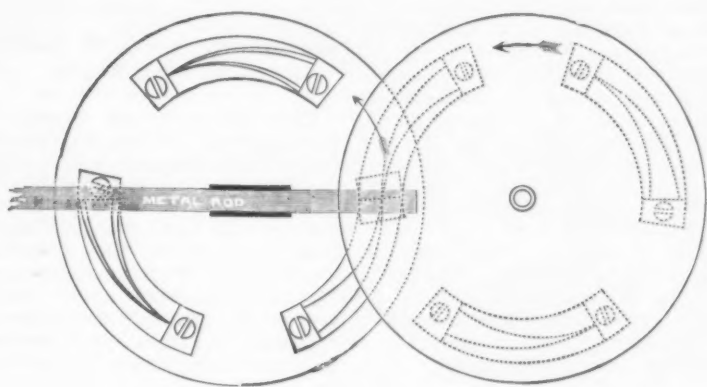


Fig. 1.—Plan of Dies.

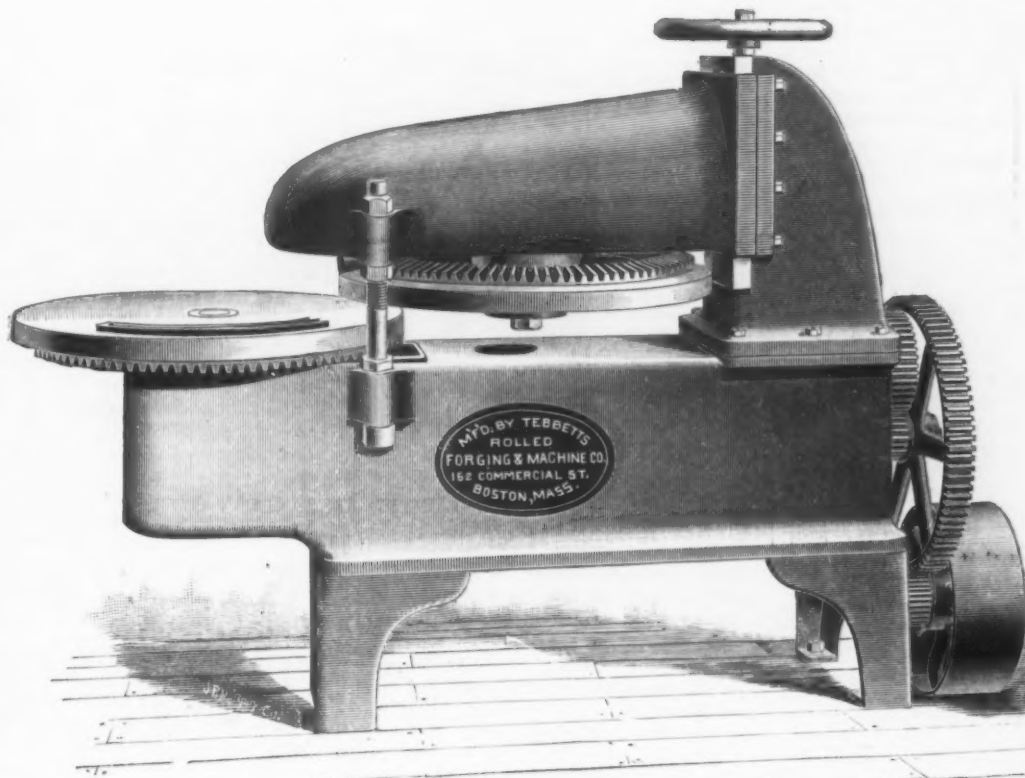


Fig. 2.—The Tebbetts Rolled Forging Machine.

THE TEBBETTS ROLLED FORGING MACHINE.

Forging with straight dies is open to another objection which becomes most serious when small articles are being rolled. We refer to the tendency to form a more or less hollow product. In forging steel balls for bearings this evil is an especially grave matter, as the after process of grinding and hardening (not to speak of uniform wear in the bearings) is dependent for success upon having forgings of perfect homogeneity. It is possible to increase the producing capacity of a straight-die machine by mounting the dies upon the edges of two properly arranged disks. But even when thus disposed they are liable to make the product hollow, because the motion of the dies is

faulty, a roll-forging machine which embodies a principle differing radically from that of other machines. This principle was fully covered by patents several years ago, and it would at the present time be more largely applied to commercial work had not much time been necessarily spent in perfecting the details of the apparatus and in developing it to a point when it should be ready to cope with practical daily work.

This improved process is the invention of C. F. Tebbetts and is now under new management. The Enterprise Mfg. Company of 17 Milk street, Boston, Mass., are at present in control of the business and have established a number of roll forging

The peculiar features of these dies are that they are curved laterally and are moved in separately centered circles. The resulting advantages are that hollow or "piped" product is not formed by the dies, which also co operate in such a way as to prevent the bar from sliding out of position. With laterally curved dies, the effect is to crowd the plastic material always toward the center of the article being rolled. That this actually does take place has been proved by the fact that among the millions of forgings that have been rolled by curved dies there has not been found a single hollow or piped specimen. Another advantage is the freedom from "cold-shuts" or undesirable lappings of

cooled metal, and still another is the strengthening and toughening of the metal.

The machine as at present constructed is represented in Fig. 2, which, by the way, shows only one set of the dies in place. Each of the two iron tables is driven by a pinion engaging with a crown beveled gear which forms part of the table itself. Beveled rollers at the proper points relieve bearings and gears of all unnecessary strain. The upper table can be raised or lowered to suit the various thicknesses of product and dies.

The rate of production of this machine is high, because there are never less than three sets of dies used on the tables, which revolve once every three seconds. Therefore, the theoretical daily production is 36,000. In practice a day's work is 25,000 articles, because a certain amount of time is lost in feeding the rods into the machines. When very small articles are rolled, such as bicycle balls, lumbermen's boot-calks, &c., five sets of dies are used per machine, increasing the actual daily output to 40,000. In certain cases it is even possible to double that production by employing special dies, each pair rolling two articles simultaneously.

A large variety of work can be rolled by this process, and the metal may be iron, steel, copper or brass. It has been found that in many instances a lower grade of steel can be used to make certain articles than would be permissible were it turned from the bar in a lathe. This is accounted for by the fact that the characteristic action of curved dies is to knit together the fibers of the metal, thus increasing its tenacity.

The Burn Stamping & Mfg. Company.

An admirably designed plant for the manufacture of milk cans has just been completed by the Burn Stamping & Mfg. Company at Chicago Ridge, 16 miles south of Chicago. The main building of the works is a very substantial four-story structure, 200 x 48 feet, with high ceilings and numerous windows. Immediately joining, but separated by a fire wall, are the boiler and engine room and an annealing house. Completely detached from all other buildings is a tinning house.

A noteworthy peculiarity of the company's methods is that they receive all their material in block sheets and do their own tinning, which they find much more satisfactory than to buy tinned stock. The sheets used are of Nos. 18 and 20, as milk cans require unusually heavy tin plate to withstand the rough treatment which they receive. The first floor of the main building is devoted to the heaviest machinery, consisting of stamping presses, welding rolls, squaring shears and a full equipment of tools for making dies. A number of special machines of the company's own design are used for some of the processes through which the material passes. The second and third floors are used for making up milk cans. Tinner's benches extend around the walls and along the center. A gas plant is being installed for the manufacture of gas for both illuminating and soldering. The fourth floor is used for the storage of made-up cans. A large freight elevator serves all floors. The machinery is run by a 65 horse-power Hamilton-Corliss engine. Water is pumped at the rate of 50 gallons per minute from a 110-foot artesian well to a tank on the roof, whence it is distributed through the building. The annealing furnaces are located in a fire-proof compartment and are of large size.

The tinning house is a typical Welsh plant. It is thoroughly fire proof, built of brick and iron. The roof is constructed of I beams, with brick arched between,

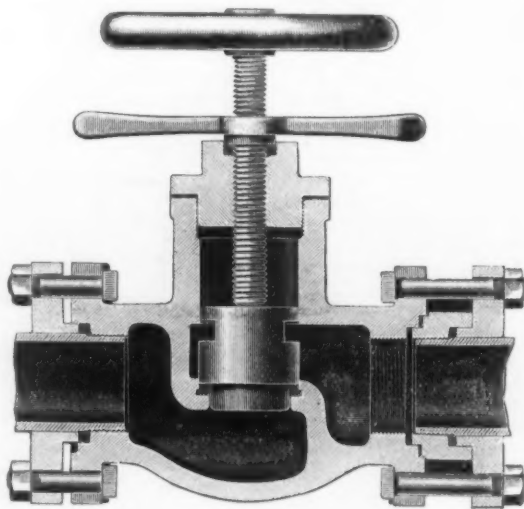
and even the windows have iron sashes. There are two tinning stacks with brick hoods. One of these stacks is fitted with what is claimed to be the largest pot in the country. It is a Phillips pot, built 20 inches wider than the standard, and will take a sheet 50 x 23 inches. The other stack has five separate dipping pots or kettles, and is of special construction to suit the class of work done by the company.

Another brick building, from 75 to 100 feet long, will shortly be erected as a wing to the main building. The ground floor will be used for storing raw material and the upper floor will be devoted to special work.

The tract owned by the company comprises 10 acres, thus giving them ample room for expansion. It is situated in an angle formed by the crossing of the Wabash and Calumet Terminal railroads. Side tracks run into the grounds between the buildings, all of which have been built so that their first floors are on a level with freight-car floors, for convenience in receiving and shipping freight. The Calumet Terminal Railroad being a belt line, connection is thus made with all the roads running into Chicago, which insures shipping facilities of the best character.

The Burtis Ammonia Valve.

The Burtis valve has been designed especially for the purpose of satisfactorily meeting the demands of all kinds of ammonia work. It is provided with a lead seat, which is firmly dovetailed into the body of the valve. Any scale or foreign matter settling on the valve seat is pressed into the lead, when the valve plug is screwed down to its seat, and will not prevent the valve from closing perfectly tight. The lead seat also prevents oxidation and corrosion when in contact with the iron valve plug. The valve consequently will always remain tight and start easily from the seat without regard to the length of time it has been closed. Since the valve plug does not revolve with the screw in closing, but is brought down squarely and firmly, the danger of cutting the seat is avoided. The stuffing box is provided with a lead packing ring, which, by means of the jam nut handle, is firmly pressed against the screw, forming a tight joint, which does not require repacking. Each valve is arranged with a union end in order that it can be easily and conveniently connected or disconnected to pipe or apparatus.



THE BURTIS AMMONIA VALVE.

The leading officers of the company have had long experience with other concerns in the manufacture of the same class of goods, and are therefore undertaking no experiment. It is their intention to manufacture all kinds of milk cans to meet the requirements of this class of trade in any section of the country from the Atlantic to the Pacific coast. Every city uses a special pattern of milk can, and local preferences must be faithfully adhered to in order to secure such trade. While milk cans will constitute the bulk of the company's business, they will also be prepared to do work for those who want special dies made or other work in related lines. Their equipment of machine tools was carefully selected to enable them to meet a demand which is rapidly growing in and about Chicago. Employment is given to between 150 and 200 hands. W. P. Ketcham is president of the company, John T. Dale vice-president, W. S. Burn general manager and superintendent, W. H. Burn secretary and M. J. Higley treasurer. The Chicago office and salesroom are located at 66 Lake street.

The old locomotive, John Bull, built in England in 1831, was taken out for an airing on the Pennsylvania Railroad and after a satisfactory trial was pronounced not too decrepit to run across the continent as far as Chicago.

The threaded pipe-ends of the valve are counterbored to receive a pure rubber packing ring and gland, which form an effective and perfect joint. The opening of each valve has the full area of its respective pipe size. The valves, which are manufactured by Morse Burtis of 52 John street, New York, are tested before leaving the works.

Dr. Peters, the well known American engineer, has recently visited the Mount Lyell copper mine in Australia, and reports the cupriferous deposit to be the second largest in the world, the Spanish Rio Tinto being its only rival. Mining plant and machinery for opening up the mineral beds are being installed, and a railway is to be at once constructed to connect Mount Lyell with Strahan, the nearest large town.

The Columbian Steamship Company, in connection with the Panama Railway and the North American Navigation Company, have issued a new tariff on west-bound shipments, affecting several hundred kinds of manufactured goods. The new rates are very much lower than have been heretofore in force either by rail or isthmus and present a reduction of from 40 to 76 per cent. from the latest reduction in rail rates.

The Nau Method of Casting Sound Ingots.

When steel is poured in a mold and left to solidify in the open air, the metal in contact with the bottom and the walls of the mold solidify first, which is soon followed by the solidification of the upper surface. The immediate result is that a metallic mass is obtained with an outside solidified envelope and an inner liquid portion. After further cooling, this inner portion becomes solidified at its turn, and by contraction gives rise to the hollow space which is found in every ingot a little below the upper surface, thereby constituting a block of metal of unsound character.

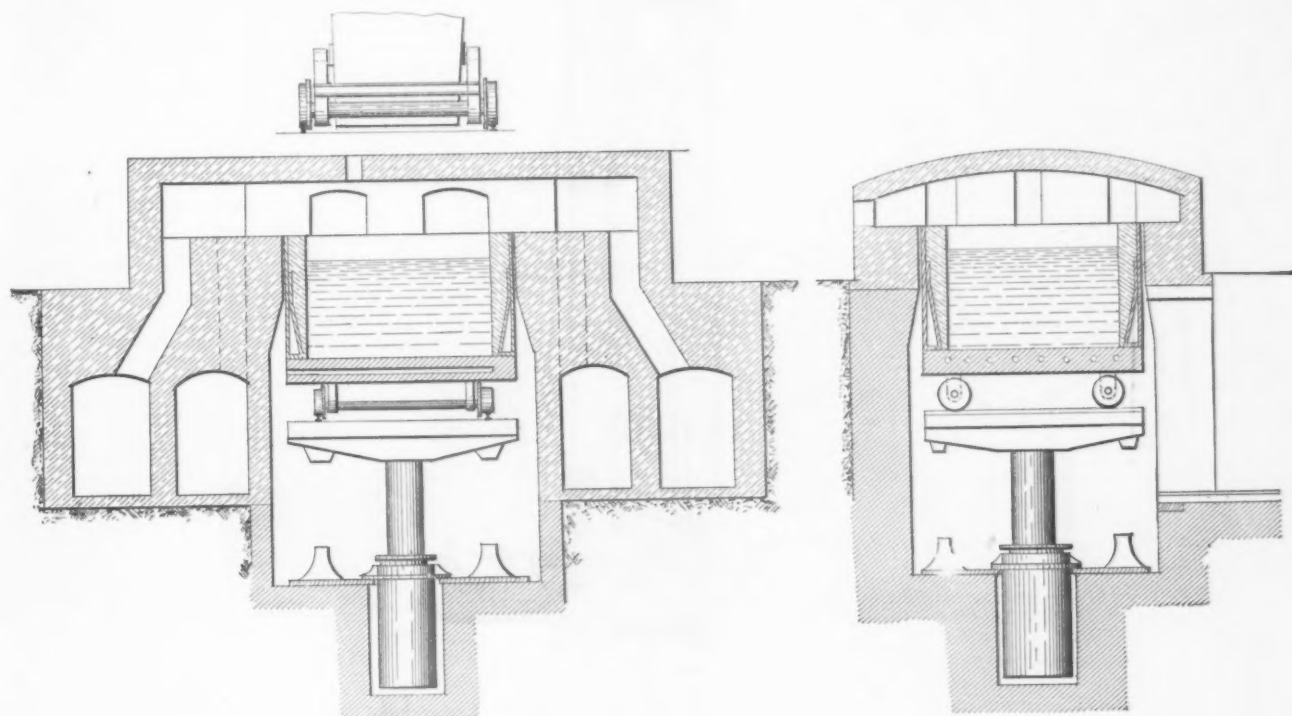
In order to avoid this defect, the metal should cool and solidify gradually, and in such a manner that solidification sets in first at the bottom of the ingot, and then proceeds gradually and successively to the

In order to obtain these results the following method has been devised and patented by J. B. Nau of Allegheny, Pa. The accompanying illustration shows the general arrangement. Instead of teeming the steel, as is done in the ordinary practice, into molds, the steel ladle with its contents is brought over a heating furnace of which the bottom is left out entirely, and in its place has a mold of sufficient capacity to receive all the steel contained in the ladle. This mold is mounted on a car, which can be raised or lowered by means of hydraulic machinery located in the foundation of the furnace. It is lined inside with refractory material of sufficient thickness to prevent a too rapid cooling of its contents. The outer iron casing of which the mold is made, presents at its lower part a double shell, which is largest at the base and decreases to nothing at its upper point. The bottom of the mold, which may be lined also with refractory material, is a cast-iron plate with a coil of

the non-metallic elements will be avoided to the same extent as it is obtained in the ordinary manner of teeming. Or the mass can be made to solidify slowly in an ascending way, and segregation of the non-metallic elements will be fostered. An ingot of heterogeneous character, containing more carbon in the upper than in the lower region, will be obtained.

This will be of great importance in the manufacture of armor plates, because it will admit of producing an ingot with more carbon on one than on the other side.

Another advantage, however, that may be derived from this method is the facility with which ingots with different physical characters and different chemical compositions on the opposite ends can be obtained. When the ingot has been solidified to a certain height, and before the upper region has passed from the liquid to the solid state, a new addition of different composition and different nature can be made on top.



THE NAU METHOD OF CASTING SOUND INGOTS.

upper regions, which must be the last to solidify. This manner of solidifying the metal will naturally prevent not only the formations of a hollow space in the upper part of the ingots, but even the blow holes that are generally found in the ordinarily cast ingots will largely be avoided. These blow holes are considered as resulting from the setting free of gases contained and dissolved in the liquid metal. When the metal solidifies first in the lower region, and when solidification proceeds in an ascending way, the gases first set free in the lower part of the ingot rise at once to the liquid region above, and by the time that complete solidification has set in, the gases have escaped in the open air.

The same may be said of the hollow space found in ordinarily cast ingots. If solidification takes place in an ascending way this hollow space will be avoided, for the reason that the liquid metal on top of the last solidified region would at once pour into the hollow space that might form in the center of this region.

This gradually ascending solidification can be obtained by having the upper surface of the metal exposed to a high temperature, while the lower part of the metal is exposed to a lower temperature.

pipes inside. This coil, as well as the double shell at the lower part of the mold, is arranged to admit of the circulation of water to cool the lower part of the ingot.

The operation is as follows: The mold, after having been raised in the furnace, is heated up to a suitable temperature. The metal is then cast through a hole in the roof of the furnace. The temperature inside is kept high during the casting as well as afterward in order to keep the upper regions of the ingot liquid, while its lower part is made to solidify by means of the circulation of cold water. If found necessary, the mold can be lowered gradually in order to increase the cooling effect at the bottom, while the upper surface remains exposed to the intense temperature of the furnace. By these means it will be made possible to obtain the solidification of the ingot in an ascending way and to avoid the formation of a hollow space in the upper region. A sound ingot will be the result. Of course these means of casting can only be used when heavy ingots are required, as in the manufacture of armor plate, for instance.

The solidification can be obtained in two different ways. The metal can be made to cool rapidly upward, and segregation of

The block of metal thus obtained, transformed later by means of hammering or rolling into a plate, will furnish a finished compound product, while the particular method of casting will largely contribute to avoid the blow holes and eliminate the danger of a hollow space.

The all-steel plates obtained thereby, in an easy manner and after a very short time, will be sound, without presenting the defects that are met with in the compound-armor plates, defects resulting, without exception, not only from a bad weld between the two metals used, but also from hollow spaces found at the contact between the two metals.

The contract for 25,000 tons of iron pipe has been awarded by the water commissioners of Manchester, N. H., to the Warren Foundry & Machine Company, Phillipsburgh, N. J., at \$26.60 per ton. There were four bids received, ranging from \$26.60 to \$26.90 per ton.

The post office telegraphs in England were worked in 1892 at a loss of £389,167. The aggregate loss sustained in working the telegraphs since their acquisition by the Government in 1870 is £4,463,686.

The Mesta Patent Automatic Pickling Machine.

The first machine of this type was designed by Geo. Mesta of the Leechburg Foundry & Machine Company over a year ago, and was patented on October 18, 1892. The original machine, which was built by the above company, was placed in the tin plate works of Wallace, Banfield & Co., Limited, over a year ago, and has been in successful operation ever since,

contain the acid pickling fluid. H is a vat constructed in the same way containing water to wash the plates after they come out of the pickling fluid. K is a piston valve through which steam is transmitted to operate the plunger C in the cylinder A. When the machine is in the position shown in the elevation, the plunger which carries the cross arms and crates can be given a vertical automatic motion of about 10 to 12 inches, thus giving the crates which contain the plates to be pickled and washed a vertical motion in

done by hand, as it is revolved on steam which is holding it up in its position, thus reducing the friction to a minimum, the crates, cross arms and plunger are revolved to such a position that the third crate is directly over the acid vat; the crate which was in the acid vat would then be directly over the water vat, and the crate which came out of the water vat would be directly over the track, on which is a truck to receive the washed plates. The plunger is then again lowered and put into the other motion to pickle and wash the plates

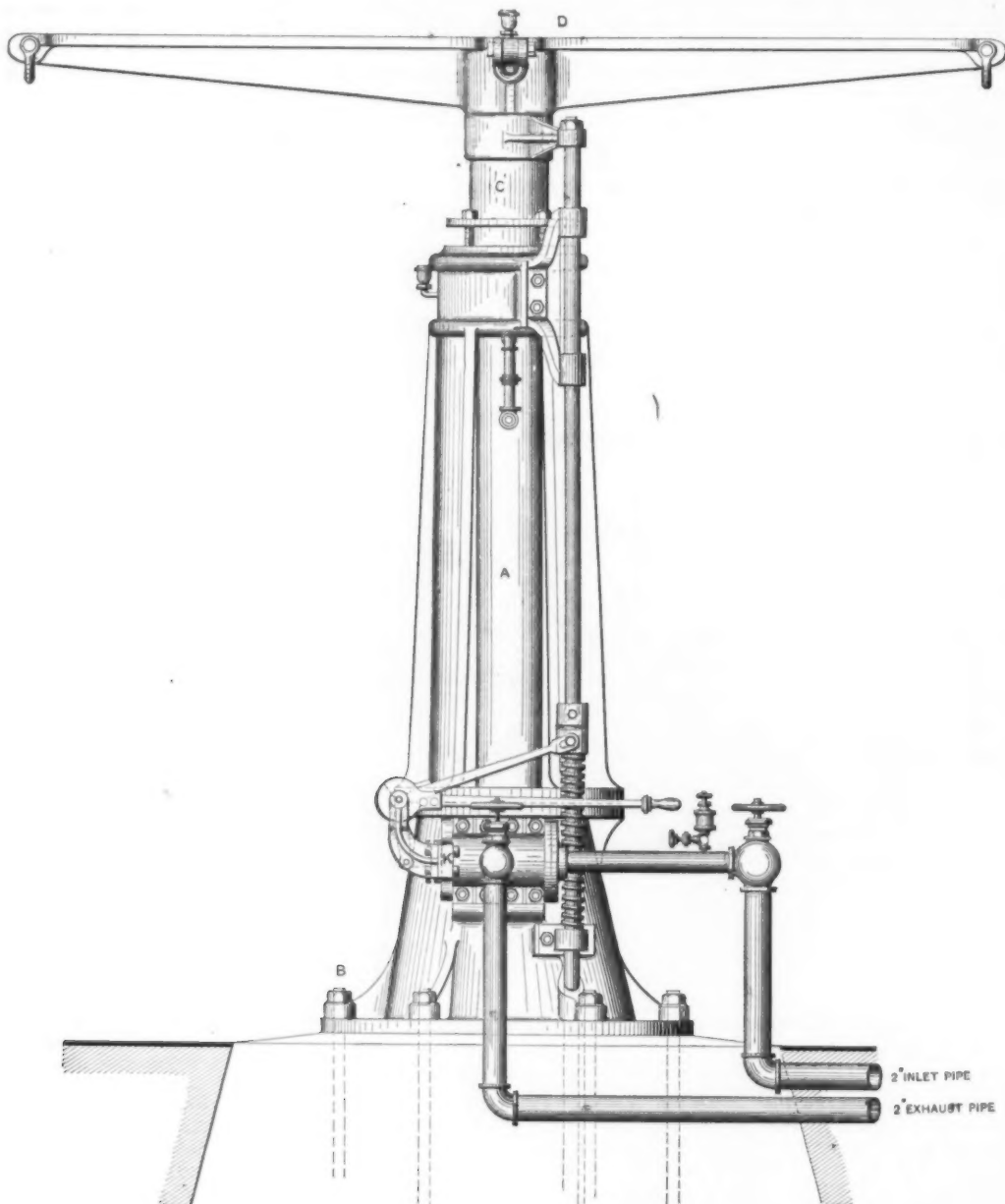


Fig. 1.—Elevation.

THE MESTA PATENT AUTOMATIC PICKLING MACHINE.

pickling about 30 tons of plate per day. Recently the same company gave an order for another machine of this type, and with the two machines they are now pickling the total product of their extensive sheet-mill plant at Irondale, Ohio.

During the past year these machines have been placed in many of the latest American tin-plate works. The largest improved machine is illustrated in the accompanying illustration, in which A represents a vertical cylinder supported by the base B, C the plunger or piston supporting the arms D, to which the crates are attached for carrying the plates to be pickled. G is a vat built up of pine strips 1 inch thick by 6 inches wide, to

and out of the washing fluids at the rate of from 40 to 50 strokes per minute. After being agitated in this manner from five to ten minutes, the plates in the acid vat are thoroughly pickled and the plates in the water vat are thoroughly washed. By means of the hand lever shown on the valve, the plunger can be changed from a short automatic stroke to the long stroke, the full length of the cylinder, which is about 54 inches, thus raising the crates containing the plates out of the washing fluids and above the sides of the vats. Before this is done, however, a third crate is attached to the empty arm, containing a new lot of plates to be pickled; then by revolving the plunger, which can easily be

which are now in the pickling vat and water vat. This operation is continually repeated. The crates to contain the plates are of a new design, and the patent for the same has been applied for. The advantage in this crate over others is that the plates can be dropped through the bottom, instead of lifting them out by hand.

Instead of the crate having a rigid bottom there are six shafts running through the bottom, and on these shafts are small arms, which form the bottom of the crate and prevent the plates from dropping through. At the end of each of these shafts there are small arms keyed to the shaft, and on the end of one shaft there is a lever, to which all of the other arms are

attached by means of pins. This lever is held in a vertical position, thus closing the bottom of the crate when the plates are to be dropped from the crate by removing the pin in the lever. The lever can be swung down into almost a horizontal position, thus opening up the bottom of the crate and allowing the plates to drop through.

The advantage of this machine is that the entire machine is supported by one base, which is bolted to a foundation and needs no other attachments to buildings or supports; it is simple in construction and effective in its work, as by no other motion can plates be so thoroughly pickled and washed as by quick vertical motion, dipping the plates in and out of the washing liquids.

The British Tin-Plate Industry.

A tabular statement showing the exports of tin and terne plates from Great Britain from 1862 to 1892, inclusive, has just been issued by Bradley & Burch of London. The statement shows a remarkable development of the British tin-plate industry during that period. The total exports in 1862 reached 1,000,437 hundredweight. In 1892 they were 7,911,600 hundredweight. The shipments of the previous year, however, were the highest on record—namely, 8,967,580 hundredweight. During all these 30 years the United States took by far the greater proportion of the British tin plate exported. In 1891, 6,502,860 hundredweight, or more than four-fifths of the total ex-

ports, and the intermediate territory. The Atchison, under the terms of the agreement, secures the bulk of the east-bound traffic, while the Southern Pacific will monopolize west-bound traffic.

Another great tower of iron and steel is being built in England at Blackpool, a seaside resort in Lancashire, which, although not so gigantic as the Eiffel tower, will yet be the highest structure in Great Britain until the Watkin tower is built. It is to be 500 feet high and is to absorb 2200 tons of metal. Half of the work is already completed, and it is said the structure will be ready for use this season. The width of the tower at the base is 98 feet, which consists of four legs resting on

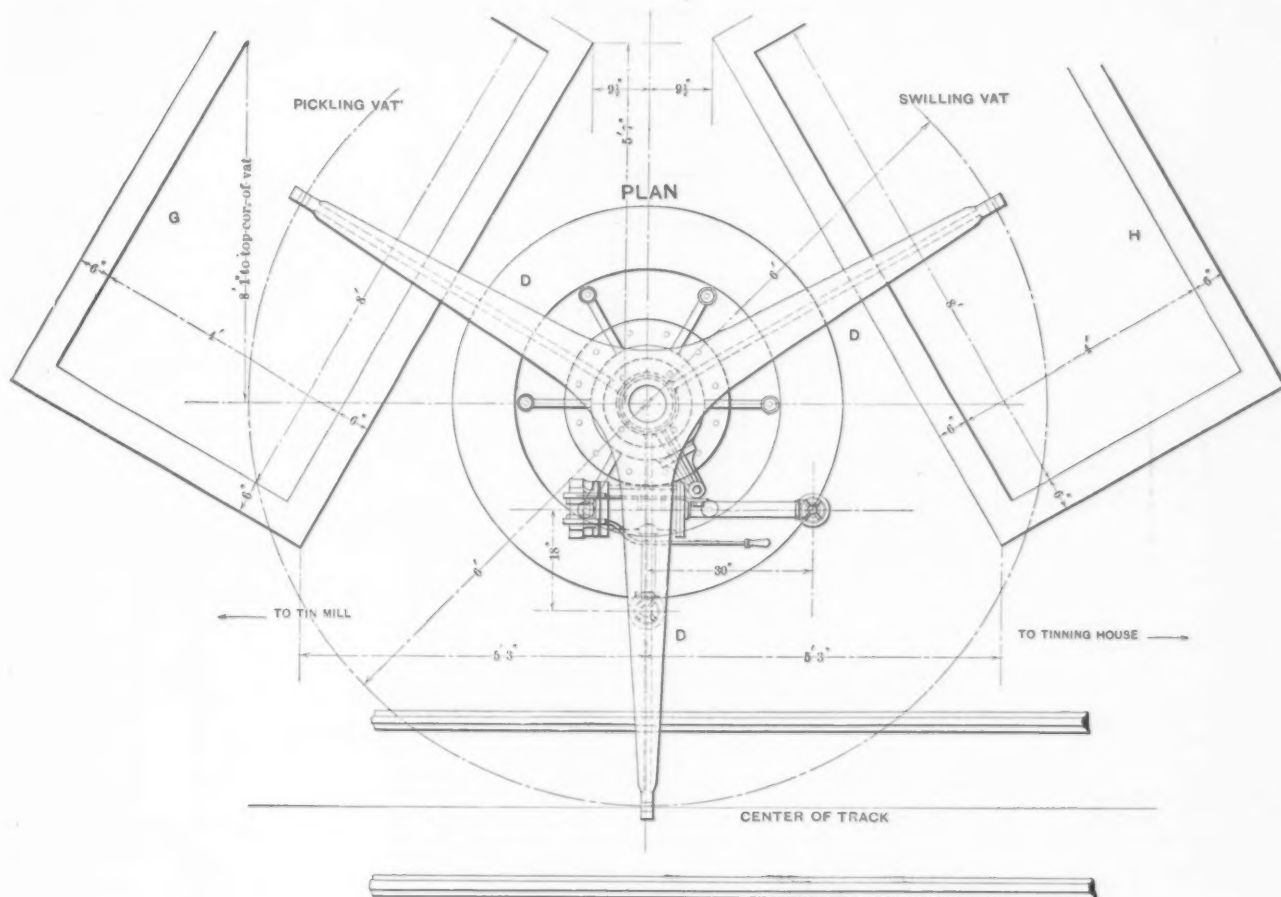


Fig. 2.—Plan.

THE MESTA PATENT AUTOMATIC PICKLING MACHINE.

The main difficulty at first found with these machines was to get a valve to regulate the flow of steam to the cylinder, and that would be economical of steam and not liable to get out of order. This has been overcome entirely by employing a piston valve with a positive motion and cut-off.

The new machine which was recently placed in the works of Wallace, Banfield & Co. has one of these valves, which requires only about one-half the steam that was necessary to operate the first machines of this type built. This machine was only designed for pickling sheets of tin-plate size, although one is now pickling plates 72 inches in length.

The wire gun just successfully tested at Bidsborough, Pa., where it was made, is 19 feet long, weighs 3½ tons, and is wound with 37 miles of wire. It costs much less than a built-up gun and was manufactured in less time.

ports, were shipped to this country. Last year this proportion was somewhat reduced, being 5,569,580 out of a total volume of 7,911,600 hundredweight of exports. It is shown in these tables that the home consumption of tin plate in Great Britain has grown in the last eight years from 1,750,000, to 2,600,000 hundredweight. There are now in England and Wales, it is stated, 100 tin-plate works in existence, comprising 509 mills; and of these mills 409 are in operation, with an estimated productive capacity of 10,500,000 hundredweight per annum. In view of these facts and figures, it is small wonder that British manufacturers of tin and terne plates view with apprehension the growth of the industry in this country.

The Southern Pacific and Atchison have made a traffic contract that in effect will give the two lines a practical monopoly of all transcontinental business to and from California and Southern Pacific

foundations of concrete blocks. The space between the legs is to be used as a circus.

In his speech at the Board of Trade banquet in this city upon the topic, "Finance and Commerce," ex-Secretary Fairchild touched upon the subject of currency. "Governments," he said, "were the creation of the people. They could give no value to any commodity that had not an intrinsic pre-existing value, and the worth of paper money depended on the security of the Government. He believed that much of the uncertainty and trouble about the currency question arose from a very popular misunderstanding of the question, and an almost universal belief in the power of governments to create value. The people of the United States," he said, "were not fools, they were among the most intelligent of the human race, and he believed they would save this country from the experiences of others during financial crises without first enduring the chilling reality."

The Storey "Solenoid" Electric Motor for Direct Machine Driving.

In former issues we have called attention to the fact that the electric motor is rapidly making for itself a place as a driver of machine tools. Except in isolated cases,

of high mechanical excellence, possessed of a maximum of electrical efficiency in proportion to the weight of material and free from the common defect, magnetic leakage.

The motor is a plain cylindrical machine having end projections for the boxes and commutator, and the accompanying en-

showing the two T-shaped fields. B in Fig. 2 shows the opposite field pieces carried by the cap ends. C in both drawings represents the cross section and location of the field windings. D are the bolts which are used in assembling the main portion of the magnetic fields. One of the unique features of this machine con-

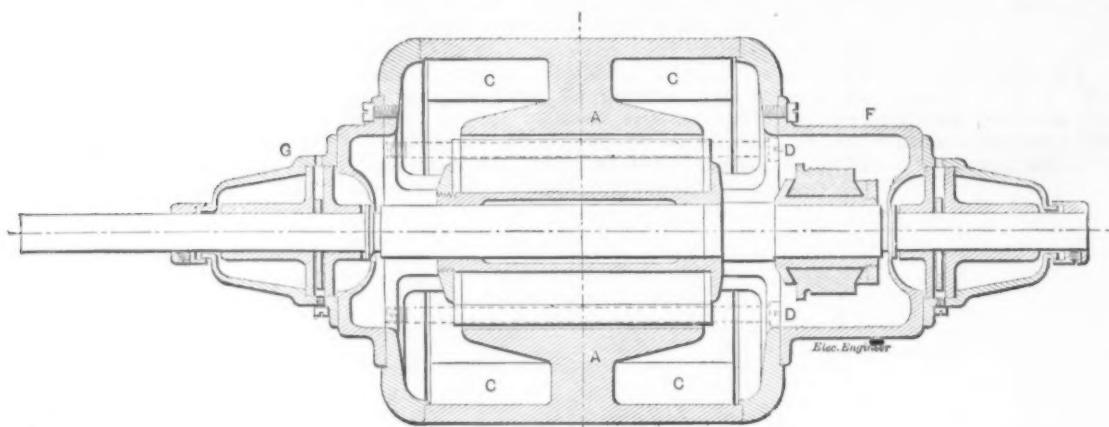


Fig. 1.—Longitudinal Section through T-Shaped Pole Pieces.

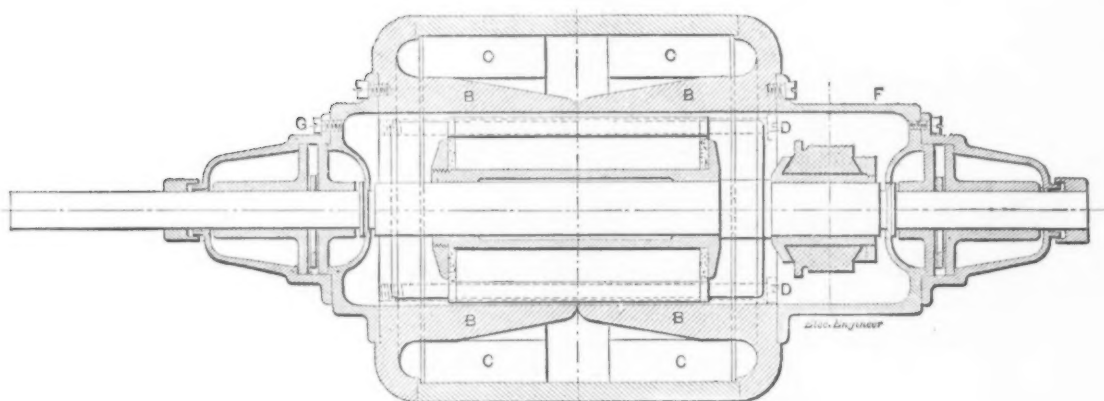


Fig. 2.—Longitudinal Section through Poles Projecting from the End Portions.

it has been necessary to introduce counter-shafts, the general arrangement being such as was described in our articles on the erecting shop of the De La Verne Refrigerating Machine Company of New York, and the works of Fraser & Chalmers of Chicago. Manufacturers of electric motors are now devoting much time to the adaptation of their motors to direct machine driving—in other words, the motor is carried by the machine it drives, making a self-contained tool in every respect.

We here illustrate the Storey solenoid motor, designed by the Hornell Iron Works of Hornellsville, N. Y., for direct machine driving, and for which the Dahl Electric Company of 120 Liberty street, New York, are the agents for the Eastern and Middle States. The first effort made by I. E. Storey, the inventor of this motor, was in the production of a motor for the direct driving of a mining drill in which all the ordinary disadvantages of electrical application of power were met under exceptionally difficult conditions, with the added trouble due to the extreme moisture and dirt of all kinds common to mining work.

The first attempt was a complete success, and led naturally to the consideration of the general adaptation of the principle to other lines which cannot fail to suggest themselves to any intelligent worker whose study has tended at all in this direction. Following out his original intention, the inventor has since produced and patented in the principal countries of the world a type of motor unique in form,

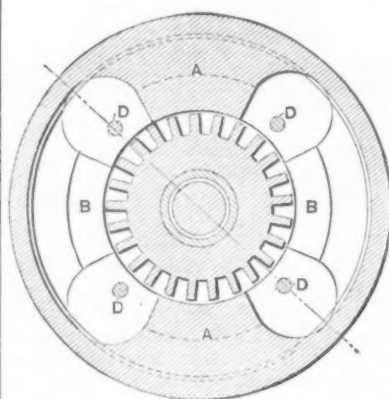


Fig. 3.—View of Field Magnets.

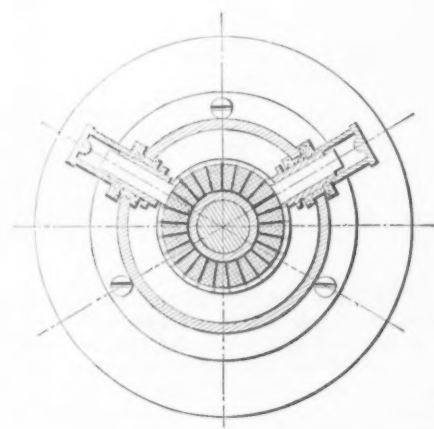


Fig. 4.—Sectional View of Commutator.

THE STOREY "SOLENOID" ELECTRIC MOTOR FOR DIRECT MACHINE DRIVING.

graving, Fig. 1, shows a longitudinal section through the T shaped pole pieces, which project internally from the cylindrical portion of the machine. Fig. 2 shows a longitudinal section through the poles projecting from the end portions, Fig. 3 a cross section through the poles, and Fig. 4 a cross section through the brush holder and commutator.

A in Fig. 1 represents the cross section of the cylindrical portion, as noted above,

sists in the construction of the field magnets, which, as shown, present four poles so arranged that while the center of the machine is of one polarity the ends are of opposite polarity, both ends being of the same polarity. From this it will be readily seen that while this is a four-pole machine it has eight distinct magnetic circuits, making the path of the magnetic lines uncommonly short and of very low resistance, giving maximum efficiency for

minimum quantity of wire. The coils C are wound on spools to size, are removed from the spools, thoroughly insulated, slipped loosely in the cylindrical chamber and occupy a position in a plane perpendicular to the center line of the shaft, being held in position by the pole pieces A and B.

The armature is of the drum type, toothed. The end caps F G serve for supports, and form the outside chambers for

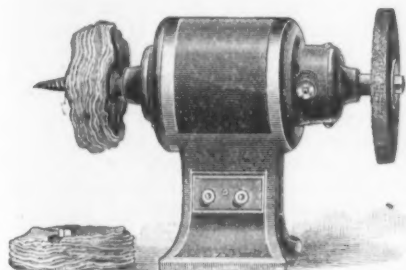


Fig. 5.—Emery and Buff Wheel Driven by Storey Motor.

the self-oiling bearings. The end cap F carries the brushes which are shown in Fig. 4. The bearings are of peculiar construction and are of such a design that the motor can be placed in any position as long as the center line of the shaft is horizontal, the end of caps F being protected by a cap projecting over the opening of the box, thereby rendering the boxes im-

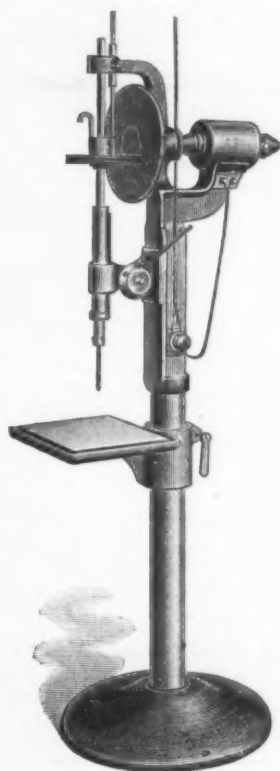


Fig. 6.—Drill Driven by Storey Motor.

pervious to dust and moisture. In cases where there is much moisture these caps are replaced by stuffing boxes.

From the above description it will be evident that the motor is practically a hermetically-sealed machine. Thus it is protected on the outside against moisture, dust or any possible external injury, and being entirely inclosed no outside injury can possibly arise from any internal condition incident to the operation of the motor, such as burning out of armature or fields, or sparking at the brushes. These features make the motor water, dust and fire proof, and hence adapt it to an enormous range of work.

The peculiar form of the motor permits a union of beauty and usefulness in com-

binations of motor and tool. In the engraving, Fig. 5, is shown an emery and buffing wheel, in which the armature is placed upon the wheel spindle, the field of the motor constituting what we may call the frame of the machine. The next engraving represents a 12-inch drill driven direct by the motor. The high and constant speeds required by tools of this description permit the electric motor to be used for direct driving with very decided advantage.

The McDowell Alloys.

The McDowell semi-steel and ferro-aluminum bronze are two metals in many respects new to the industries into which they are being introduced, and a short description of their peculiar qualities will be of interest to the various consumers of castings, as well as to manufacturers of metal engaged in supplying their wants.

The McDowell Steel Company, Room 305, The Rookery, Chicago, are the owners of the process for making these metals, either in an air or gas melting furnace, or in an ordinary foundry cupola, and are also manufacturers of the special alloys.

The following are exhibits of successive heats of inch bars of semi-steel tested on a Riehle testing machine.

Date.	Breaking strain. Pounds.	Tensile strength. By R. W. Hunt & Co. Pounds.	
		By R. W. Hunt & Co.	Pounds.
February 2.....	3,750	.....	.....
February 3.....	3,800	.....	.....
February 4.....	4,100	.....	.....
February 6.....	3,950	.....	.....
February 7.....	4,275	.....	.....
February 8.....	3,900	.....	.....
February 9.....	3,975	.....	.....
February 10.....	4,400	.....	.....
February 11.....	3,800	.....	.....
February 14.....	3,950	.....	.....
February 16.....	3,950	.....	.....
February 17.....	4,225	.....	.....
March 20.....	3,600	30,000	.....
March 21.....	3,450	35,000	.....

The breaking strain of these 14 different heats, ranging from 3400 to 4400, was made to vary intentionally to meet the condition of castings required. The bar showing the lowest breaking strain gives the highest tensile strength. As a general thing castings are not made to resist strains in tension, but in compression and torsion. Semi-steel is recommended by the manufacturers as especially adapted for tool machines, engines, hydraulic and ammonia cylinders, valve seats and faces and gearing of all kinds where surfaces are exposed to constant wear. They explain that the carbon being in an uncombined condition the graphite is a natural lubricant, thus supplying what is lacking in a steel casting. The toughness and ductility enable it to withstand sudden strains, shocks and vibration far in excess of gray-iron castings.

Ferro-aluminum bronze is an alloy of metal and iron. The metalloids so common in iron are eliminated to such an extent that there are not enough left in the iron to insure sound casting. This deficiency is supplied by metals whose relation to the iron and what carbon is left does not affect it, as the eliminated metalloids do, so that a solid homogeneous casting is produced which is hard and brittle, but when annealed is soft, ductile and strong, in many respects similar to steel, and is intended to supply a want not met by steel or malleable-iron castings. It is stronger than malleable iron, not always so strong in tensile strength as steel, but in a casting is claimed to be more reliable.

Exhibits of heats tested by R. W. Hunt & Co. of ferro-aluminum bronze are as follows for inch bars:

A.	B.	C.	D.	E.	F.
Unannealed.	An.	Un.	An.	Un.	An.
Pounds..24,000	45,000	34,000	55,000	45,000	21,000

The foregoing are exhibits of three different grades of ferro-aluminum bronze.

A and B are the same metal. A is unannealed, while B has been annealed. This grade of metal is tough, ductile and strong, making a metal well adapted as a substitute for wrought work in cars, vehicles and agricultural implements. C and D are specimens of the same metal. C is unannealed and D annealed. This grade is not so soft and ductile, but tough and homogeneous, well adapted for crank and cam shafts, rocker arms and wrist pins, pinions and roughing rolls in a rolling mill train, racks, pinions and gear wheels.

E and F are the third grade, showing the strength annealed and unannealed. This grade is to be used more especially unannealed, as it is made for an anti-acid metal to be used in large kettles, in copper and silver smelting works, bottoms of pans in plaster works, acid pans in oil refinery, cylinders in paper-pump manufactories; and when annealed, for propeller wheels on ocean steamers.

Semi-steel and ferro-aluminum bronze can be made in any well-equipped foundry having a cupola, flasks, sand and facings used in ordinary gray-iron casting, only requiring separate floor room for the different kinds of castings and special ladles for each kind of metal. The only addition would be an annealing oven for annealing the ferro-aluminum bronze. The annealing process requires from 48 to 96 hours, depending upon the size of the castings.

The National Finishers' Union.

The first annual convention of National Finishers' Union, composed of skilled workmen formerly members of the Amalgamated Association, but who withdrew from that body, will be held at Youngstown, Ohio, on Saturday, May 6, at which a wage scale will be prepared and submitted to the manufacturers as soon after that date as possible. As this meeting will be held about one month before the annual convention of the Amalgamated Association of Iron and Steel Workers, which will be held in Pittsburgh in June, it is not improbable that some complications may arise. It is claimed that in mills where little or no puddling is done the scale of the National Finishers' Union will be considered in preference to that of the Amalgamated Association. In a recent interview an official of this new labor organization gave the following statement concerning it:

"At the last convention we introduced a resolution to clean out the membership by dropping all but skilled workmen. The unskilled workmen were in the majority and our resolution was treated with contempt. They would not honor a request of 3000 or 4000 finishers. We had nothing to say. The sheet mill and steel mill men voted for the general scale in the convention and afterward went out, held conferences with the manufacturers and made scales of their own. We objected and formed this union. At present we have 15 lodges—one each at Jones & Laughlins' mill, Oliver's Tenth and Fifteenth street and Lower Allegheny, and a central lodge composed of men from different mills where we did not secure a sufficient number of men for a separate lodge. I am almost certain that there will be no change in the scale for next year. The Amalgamated Association will, therefore, not be able to make any change. If it asks for an advance the manufacturers will all sign our scale, and if they make a reduction their members will desert and join our union. We have organized a lodge at Westerman's mill at Sharon, reports to the contrary notwithstanding. At the meeting of the Amalgamated Association Lodge, John D. Carey, our national president, spoke for an hour on the purposes of the union, and was followed by

Assistant, President McEvoy. The men were given one week to decide, and at the end of that time 33 joined our organization."

The Neuert Friction Clutch.

In the accompanying engravings we show three views of the friction clutch made by the Neuert Mfg. Company of 125 Rees street, Chicago. It was designed especially to meet the demand for a clutch having few parts and yet being effective and reliable in its working. It can be used for all purposes—on pulleys, gears, hoisting drums, elevators, cut-off couplings, &c. It can be instantly adjusted when necessary, but once adjusted the large friction surfaces make readjustment almost unnecessary, as there is hardly any perceptible wear.

hub of the flange above mentioned. This flange is also faced on the outside, and its hub has openings through which the steel levers pass, which are pivoted with steel pins to the hub of the outside flange. The steel levers fastened to the outside flange have their ends passed into apertures in the hub of the lower flange; their outer ends are connected by toggles or turnbuckles to the usual sliding block. The turnbuckles are adjustable. The clutch is operated by a sliding block on the shaft.

The Schönwald Open Hearth Furnace.—At Friedenshutte, Germany, an open hearth furnace was remodeled on the Schönwald system. It went into work on November 14, 1891, and was never out of fire until July 11, 1892. During this period it made 712 charges in 205 working

Influence of Electricity Upon Plants.

As bearing upon the interesting question of the influence of electricity upon vegetation, the results of a series of experiments recently made by Professor Bonnier of the Paris Faculty of Sciences in this direction have attracted considerable attention. M. Bonnier carried out his observations in connection with the electric pavilion of the Central Market, investigating the influence of the electric light, both continuous and intermittent, upon the structure of trees. His conclusions are: 1, Considerable modification of structure may be produced in the leaves and young stems of trees by continuous exposure to the electric light; 2, it is possible by means of this illuminant for the plant to respire, assimilate and transpire

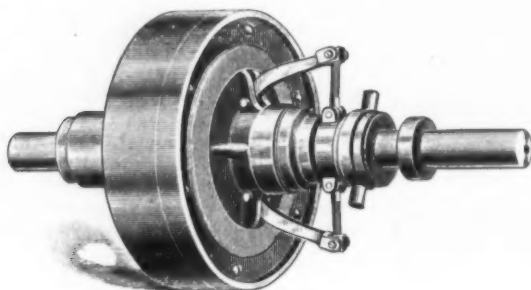


Fig. 1.—Perspective.

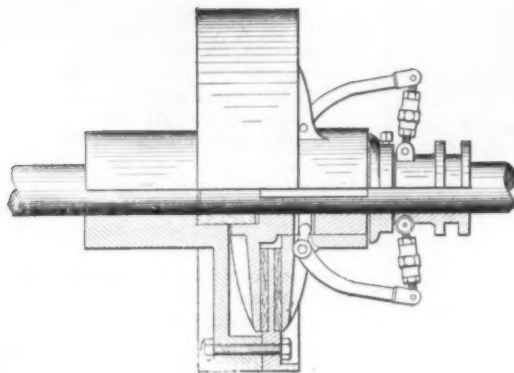


Fig. 3.—Pulley with Clutch Attached.

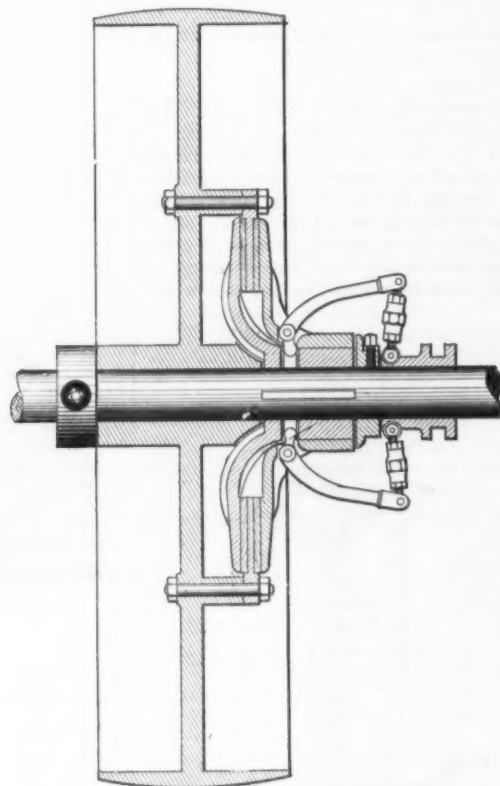


Fig. 2.—Clutch as Cut-Off Coupling.

THE NEUERT FRICTION CLUTCH.

Fig. 1 is a perspective view and Fig. 2 is a sectional view of the clutch as a cut-off coupling, which, however, can also be used in connection with any ordinary wooden or iron pulley by clamping it on to the hub of the same. This makes a convenient device, in case the size of the pulleys has to be changed at any time, as it does not necessitate the changing of the clutch.

Fig. 3 shows a regular pulley with a clutch attached to it. The pulley has cast lugs or bosses on its arms, to which the friction plate or ring is fastened, and which takes the place of a casing where used as a coupling. The clutch consists of one friction plate or ring bolted to the arms of a pulley or to the casing of a coupling. On both sides of this plate wooden friction blocks are fastened and accurately faced. Of one flange with long hub bored to fit the shaft, the outside surface of which is turned to receive another flange which slips over it like a telescope, the inside face of the outer flange being true with the face of the inside one. Of a flange with a hub bored to slide over the

days of 24 hours, the production amounting to 8562 tons of ingot metal, chiefly very soft. The daily outturn was thus 40.8 tons. In 594 charges the metal produced had less than 0.1 per cent. of carbon, and only 15 of the total, 712, resulted in metal with more than 0.2 per cent. of carbon. The average campaign before reconstruction did not exceed 200 charges. Since that earlier record Furnace No. 1 has made 530 charges during a second run, making 6598 tons of ingots. After the 365th charge a three-day repairing of the roof was necessary. The average daily product was 41.2 tons. Soft steel was the principal product, 435 charges being under 0.10 carbon, 69 charges between 0.10 and 0.20 carbon, and five charges above 0.20 carbon. Out of the whole number of charges 335 were below 0.05 phosphorus, 188 were between 0.05 and 0.08, and only 7 above 0.08 phosphorus. Furnace No. 2 has now put through 668 charges and will certainly, judging from its condition, reach 700 charges. One day's repairs of the roof were made after the 428th charge.

day and night uniformly. The plant would, however, seem to be incommenced in its growth by this continuity and its tissues have a simple structure; 3, intermittent electric light—12 hours darkness in 24—produces in the various plant organs a structure which resembles more closely the normal structure than that produced by the uninterrupted electric light. Some years ago C. W. Siemens conducted experiments in greenhouses illuminated at night by electricity, which led him to the conclusion that plants required no night rest, but developed faster when exposed to the light night and day. The later experiments tend to prove that, although the faster development is true, it is made at the expense of the vitality of the plant, which would generally be too feeble to bear fruit and produce seed when forced under continuous light. The conclusion of M. Bonnier is, therefore, that the provision of nature whereby vegetation, in common with animal life, is given a period of darkness and rest in each 24 hours is the condition most favorable for its healthy development.

The Tennessee Coal, Iron and Railroad Company.

From advance sheets of the reports of the officers of the Tennessee Coal, Iron and Railroad Company we take the following data relating to the financial affairs of this large producer. During the year the property of the DeBardeleben Company was purchased by the payment of \$7,850,000 of common stock and the assumption of the bonded debt of \$3,000,000 of that company and all their floating debt, which was, however, largely exceeded by the available assets of their treasury. The Cahaba Coal Mining Company were purchased by the payment of \$1,100,000 of bonds, of which \$100,000 remained on hand as a treasury asset. The effect of these acquisitions has been to increase the area of the company's lands from about 210,000 acres to 400,000 acres; to increase the number of their blast furnaces from 10 to 17, and their daily output of coal from 7,000 to 13,000. The report of the president states that this mineral domain represents in area more than 80 per cent. of all the available and accessible mineral lands of the States of Tennessee and Alabama, and more than 60 per cent. in value of all the coal and iron in both of these States.

The common capital stock has been enlarged from \$9,000,000 to \$20,000,000, the preferred capital stock remaining at \$1,000,000. The net amount of bonded debt is \$9,198,423.82, the total fixed charges payable annually being \$725,960, while the fixed charges chargeable to profit and loss are \$598,690 annually, leaving available for the redemption of bonded debt in 1893-94, \$136,270.

The general balance sheet shows bills payable \$1,546,481.35; accrued interest, not yet due for payment, \$122,140.83; creditors on open account, \$945,062.88; due employees, \$173,066.41. Among the leading items figuring in the assets are: Land account, \$20,747,308.98; permanent investments, including collieries, coke ovens, furnaces, plant and equipment, \$8,600,707.61; temporary investments, \$19,204.35; treasury bonds, chiefly of the DeBardeleben Company, \$1,363,000; stock of the DeBardeleben Company, \$856,41.70; debtors on open accounts, \$1,425,571.62; inventory account, salable, \$937,521.49; convertible, which applies to raw material, \$137,798.83, and consumable, referring to supplies, \$144,914.08. Cash items aggregate \$152,274.09, and suspense accounts, \$130,953.54.

The profit and loss account shows that there were brought forward by the old Tennessee Company \$461,892.65, by the DeBardeleben Company, \$428,950.37, and by the Cahaba Company, \$141,516.27. The profits during the year and the losses of the different divisions are given as under:

January 31, 1893.

Undivided profits brought forward..	\$1,032,359.20	
This year's profits:		
Bessemer division, 11 months.....	\$387,570.17	
Pratt mines division ..	335,540.90	
Cahaba division, seven months.....	94,462.92	
Tracy City division	94,076.49	
Ensley division.....	67,584.39	
Total.....	\$799,234.87	979,234.87
		\$2,011,594.16
Less—		
Loss at Birmingham division.....	\$27,236.02	
Loss South Pittsburg division	14,627.28	
Loss Cowan division.....	11,518.57	
Loss Poplar creek division.....	2,302.57	55,684.44
		\$1,956,909.72
Balance forward of undivided profits.....	\$1,322,428.67	

During the year the interest was paid and accrued, but is not due, to the total amount of \$547,892.05, there being paid dividends on the preferred stock of

\$80,000 and a bond premium account of \$5589, leaving a balance of undivided profits carried forward of \$1,322,428.67.

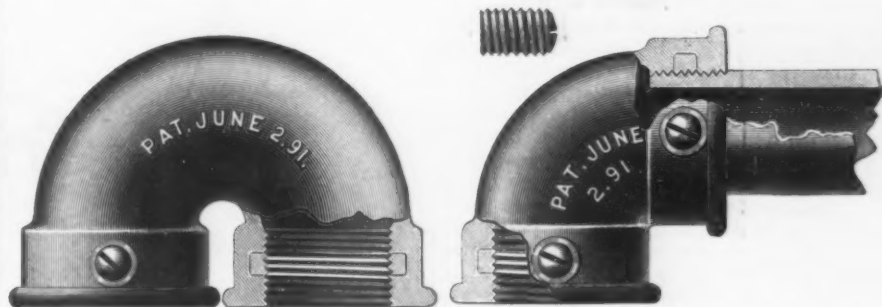
James Bowron, the secretary, shows that the balance of profit unappropriated is \$290,069.38, or about 1½ per cent. on the common stock. This sum, however, includes only 11 months' workings of the DeBardeleben Company and six months of that of the Cahaba. The undivided profits of over \$1,300,000 are not in divisible shape, and the recommendation is made that all or a large part of this sum be written off in lieu of depreciation or reduction of capital valuations, nothing having been done in this way for the past three years.

A New Joint for Couplings, Tees, &c.

The Tight Joint Company of 545 West Twenty second street, New York, are putting on the market a new form of joint, applicable to ammonia tees, couplings, return bends, and, in fact, to all kinds of fittings. This joint is similar to an ordinary screw coupling, except that a groove is cast in the threaded portion of the fitting, into which a collar or ring of lead is run. This is formed upon a threaded mandrel of slightly smaller size than the coupling, so that the lead projects a very little beyond the threads. A small hole

10; for those between 16 and 18 years, 11 hours a day is the limit, or 60 hours a week. These working hours are to be divided by one or more periods of rest, aggregating at least one hour during the day, and one rest day in each week is secured to all young people under 18, as well as to all women workers. Penalties ranging from 5 to 15 francs are laid down for each infraction of this law and for each worker affected. There are also numerous special regulations affecting female and child labor in various industries, which are calculated to improve the condition of those coming under the influence of the new law.

Pacific Coast Defenses.—Irving Scott has returned to San Francisco from a trip to Chicago and Washington with the plans for the new gun and forge factory which is to be erected at a cost of \$5,000,000, for the manufacture of guns for coast defense purposes. It is to be called the Union Gun & Forge Company and is to be run in connection with the Union Iron Works. Speaking of his proposed plant, Mr. Scott said: "The Government has decided to spend about \$30,000,000 for coast defenses at San Diego, San Francisco, and the mouth of the Columbia River. That amount was set aside for the Pacific Coast, the entire amount for the whole country being about \$127,000,000. To defend this coast



NEW JOINT FOR COUPLINGS, TEES, &c.

with a thread cut upon it is made through the exterior of the coupling, into the lead filled recess, and a small set screw is inserted. If now a pipe is screwed into the coupling it will expand the leaden packing, causing it to tightly fill the screw threads, and if the joint is not made tight by this means, one or more turns of the compressing screw crowds the lead around the pipe and makes it absolutely tight.

The tight joint does not leak from unequal expansion and contraction, because the pipe when heated expands the lead packing and fills the recess and the pipe threads. Upon cooling the fitting contracting about the leaden ring forces the lead around the pipe and again makes it tight. In hydraulic systems any loosening of the pipe is readily taken up by the compressing screw.

Exhaustive tests made of this joint have proved that it will remain tight under the highest pressures and most trying conditions.

After lengthened discussion in the Chamber and in the Senate, a bill has lately become law in France which will modify to a considerable extent the conditions of labor for women and children in that country. Under the provisions of the new law, which includes workers in factories, mines and shops, night work is forbidden for all women and for boys under 16 years of age. Children under 12 are not allowed to labor. The daily working hours for children under 16 years of age, either male or female, are limited to

\$120,000,000 will be required, and it will be forthcoming."

An influential London hebdomadal, perhaps moved by a feeling of jealousy, argues that notwithstanding Americans have acquired two of the best British-built steamships we shall be unable to compete with English lines, chiefly because of the greater cost of building ships on this side of the Atlantic. But it appears from the figures given that the writer makes no allowance for the improved facilities for building now in the possession of American yards, which make ships much less costly at the present time.

For two or three years past we have followed the proceedings of the Tinned-Plate Manufacturers' Association, which, at the time of the revision of the duty on tin plates, was an active agent in bringing about concerted action among those who contemplated going into the new industry. Rumors are gaining currency, however, that affairs with the association are not going altogether smoothly, and in fact there are some so skeptical as to believe that the association has not a very long future ahead of it. It has been pointed out that many prominent concerns are not members of the body, and what is perhaps more ominous, at the recent meetings a number of prominent members have not attended. However, all associations go through periods of varying efficiency, and it is by no means inevitable that the Tinned-Plate Manufacturers' Association will cease to be conspicuously useful.

The Lee Piston Head.

This piston head, the invention of Henry M. Lee of Waterville, Maine, has been found to work very successfully in hydraulic wood-pulp grinders and is claimed to be equally applicable to steam. The bottom plate A of the piston head is cast with a central upwardly extending hub, having a central hole for the piston rod. Between the plates A B is located the usual split ring, C, and around the exterior are the packing rings D. Upon the central hub is loosely supported a thimble, E, which has radially extending screw rods provided with nuts for regulating the tension of the springs F G, which loosely pass over the screw rods, the former being designated as the main spring and the latter the supplemental spring, thus forming a compound spring.

It is the purpose to secure as strong a pressure as possible and at the same time have it distributed with uniformity over the main spring in order to secure the best possible results. The main springs F, which are flat and of the usual shape, have the ends curved and press against the split ring C in the ordinary manner, while the supplemental springs are different in construction from those in ordinary use in that the springs are flat and have their ends curved inward as shown, and these ends are not rigidly connected to the main spring but press loosely on it, consequently better results are obtained. Each of the main springs is provided with a supplemental spring with its ends bearing upon the main spring at both sides of its center, thus increasing its pressure throughout the length and with better effect. The tension of the supplemental spring upon the main spring is regulated by the nuts referred to. In those piston heads where two or more packing rings are used it is found necessary to so place them with relation to each other that the joints will be broken, or in other words, not come on the same line. This is done, of course, to prevent any leakage in the piston head, but it has been found in this class of piston heads that the vibration when the piston is in motion will cause the packing rings to turn on the split metal ring and shift their position with relation to each other so that the joints will not remain unbroken, and as a result the piston head will leak. Now, to avoid this the thimble E is made to fit loosely over the hub, so that any tendency the packing has to turn it will carry with it the split ring, the thimble and its connections, thus insuring the packing rings remaining stationary with relation to each other, so that the joints will at all times be broken and thus avoid any leak in the piston head. A further advantage of the thimble loosely fitting over the hub is in the equalization of pressure of the springs, as any unequal pressure of one spring will be equalized by the thimble adjusting itself on the hub to give to all the springs bearing upon the split ring uniformity of pressure.

The progress in erecting the machines in the new south wing of Watervliet Arsenal is marked. Several small machines are in operation already, but none of the larger ones will be started for several months. The latest arrival in the line of machinery is a large turning and finishing lathe from the Pond Tool Works, and the assembling of this mammoth machine is now keeping busy a special corps of men from that company.

It is not a cause for regret, the New York *Bulletin* says, that Judge Speer in Georgia authorized a railroad receiver to treat with the Brotherhood of Locomotive Engineers as an organization. The repeated refusals of the agents of organized capital to recognize organized labor seem to have made an

unfavorable impression on the country, and one that possibly may not in the long run benefit property owners.

Behavior of Steam in the Cylinders of Engines.

Through the courtesy of the Chapman Valve Mfg. Company we are permitted to take the following article by F. W. Dean, which appears in the last edition of their catalogue:

One of the greatest obstacles in the way of improving the steam engine is the difficulty in understanding the behavior of the steam within the cylinder. This is caused largely by the obscurity of the action of the walls of the cylinder. It is now well understood that often an astonishing amount of the steam that enters a cylinder is condensed before any work is

fully up to the temperature of saturated steam of the pressure carried can be successful in preventing initial condensation as long as iron cylinders are used. Steam jackets, while they are known to be a means of economy, can only be considered as a partial means. In order to prevent the enormous initial condensation that occurs, jackets should be nearly as great evaporators as the boilers themselves. A jacket in itself is a source of waste, for it increases the external radiating surface of the cylinder, and is itself hotter than a similar unjacketed cylinder. Moreover, when exhaust occurs, heat is carried from the jacket out of the cylinder. This loss of heat is known as "exhaust waste," and in single-cylinder engines, or in the last cylinder of a multiple-expansion engine, cannot be recovered. In a compound or triple-expansion engine, any exhaust waste from the

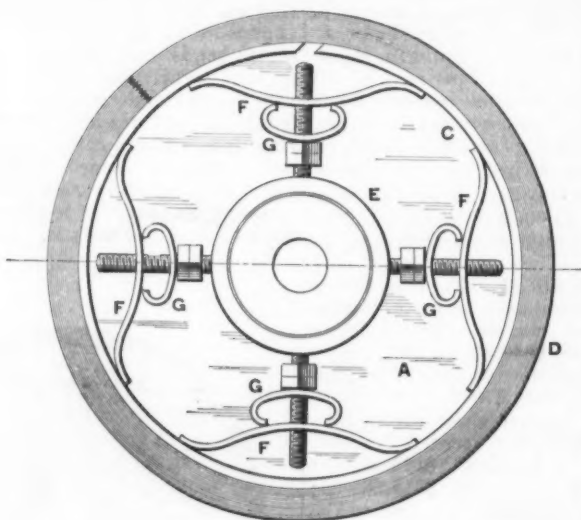


Fig. 1—Face View.

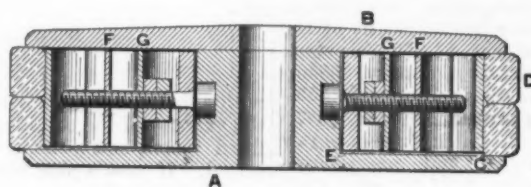


Fig. 2.—Cross Section.

THE LEE PISTON HEAD.

done. Before the piston can be moved, it and the cylinder must be heated to the temperature of the steam, and this can only be accomplished by condensation of the entering steam, which thus gives up its heat. This has been so often investigated with great care that there can be no doubt about it. By carefully studying diagrams made by accurate indicators, and ascertaining the quantity of steam entering the cylinder, the amount and variations of condensation can be ascertained. One who approaches this subject for the first time will be astonished at the results. Improvements in the utilization of steam must be directed toward the diminution of initial condensation, which in some cases amounts to 50 per cent. of all the steam used. All practicable efforts to prevent or greatly diminish cylinder condensation have failed. Condensation in small cylinders has been prevented by means of gas flames playing upon them, but this is evidently out of the range of practicability. Nothing short of a sufficient supply of heat to keep the temperature of the walls

first cylinder is utilized in the others, and in general, in a multiple-expansion engine, any exhaust waste is utilized except that in the last cylinder. The reason, then, why jackets are, on the whole, sources of economy is that they are to some extent carriers of heat from the boiler to the working steam, and thus do somewhat diminish condensation. The jacket should, of course, drain into the boiler, and when this is the case it is easy to see that each particle of steam supplied to the jacket is a messenger of heat, which, by condensation, it supplies to the cylinder walls and thus to the working steam. When condensed it flows back to the boiler, becomes charged with more heat and returns to the jacket again to deliver its heat to the working fluid. It follows from this that the greater the condensation of jacket steam and the more rapid the circulation, the more efficient the jacket is. It is sometimes difficult to secure circulation, and in order to avoid this difficulty jackets are often made the passages of the steam to the cylinder. While this construction secures circula-

tion, it is obviously less efficient than a well circulating independent jacket supply, as in the former the working steam must be nearer the condensing point when it enters the cylinder. The efficiency of jackets is well established and conditions must be unusual to render them useless. Their efficiency may be low whenever superheated steam is used, and in many cases jackets are doubtless full or partially full of water, which renders them worse than useless. Difficulties of this kind are common at sea, and jackets have consequently been omitted on the White Star steamers "Teutonic" and "Majestic."

The condensation thus far mentioned is that which occurs before the cut-off, and is called initial condensation. It is due to fresh steam coming in contact with clearance, cylinder and piston surfaces which have just before been in contact with exhaust steam, which is of low pressure and temperature. This could be prevented not only by heating the walls

which now begins to flow out. This evaporation increases as expansion continues and as exhaust goes on. When the exhaust valve closes early enough to produce compression, the walls are somewhat heated as the steam is compressed.

The diagrams of expansion hitherto drawn have followed a curve called the hyperbola, or curve of equal temperatures. As far as an investigation for determining the amount of work that can be done in a cylinder is concerned, this curve answers well. In most cases actual indicator diagrams from cylinders nearly coincide with the hyperbola, but it should not be assumed from this that the law of expansion of steam is ever shown by that curve. As the steam expands, the curve tends to fall below the hyperbola, but as re-evaporation occurs, the additional steam thus supplied increases the pressure, and thus the curve rises. But no part of the steam expands hyperbolically.

There is another curve that is sometimes useful in investigating the expansion of

same volume, the difference in pressures is that due to condensation or superheating, according as the actual curve is within or without the saturation curve.

Initial condensation is produced to some extent by the amount of water which lies in the clearance spaces after exhaust. This water is variable in amount, and has a variable effect. In one instance the condensation was greatly diminished by circulating steam through a small pipe lying in the clearance space of the engine.

An apparently trifling difference in the law of expansion makes a great difference in the heat needful to produce it, and conversely, a great change in the heat supply makes but little difference in the law of expansion. Consequently nearly all indicator diagrams look alike unless they are drawn by good instruments and carefully examined.

The chief loss of efficiency in working steam is due to the narrow limits of temperature through which it is used. For instance, in using steam at 125 pounds by gauge, and exhausting at 2 pounds above the atmosphere, the corresponding temperatures are 353° and 219°, the difference being only 134°. At the upper temperature the total heat of a pound of steam is 1189.6 units, and at the lower 1148.7, the difference being only 40.9. If the upper temperature had been that due to 210 pounds by gauge, and the lower that due to 3 pounds absolute, the corresponding total heats would be 1201.4 and 1125.1, giving a difference of 76.3, which is a gain of 35.4 units of heat, or 86½ per cent., not in efficiency, but in the number of heat units utilized.

Other causes of loss of efficiency are, as stated by Cotterill, as follows:

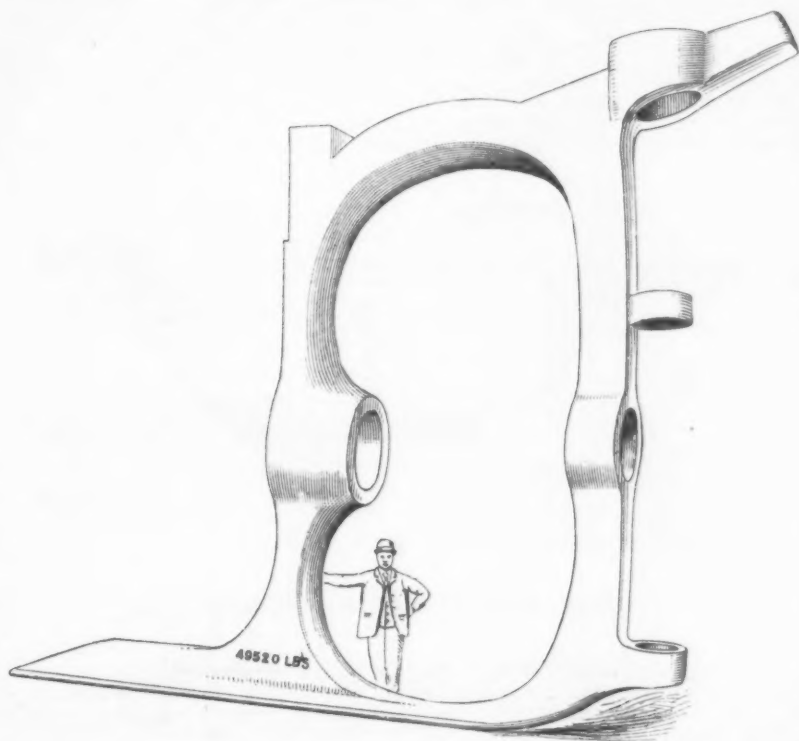
- (1.) By radiation to external bodies.
- (2.) By transmission of heat to the exhaust steam (already included).
- (3.) By clearance and wire drawing.
- (4.) By misapplication of heat to the feed water.
- (5.) By misapplication of heat during expansion.
- (6.) By incomplete expansion.
- (7.) By excess back pressure.

Cast Steel Stern Post.

The Standard Steel Casting Company of Thurlow, Pa., have just completed and shipped an open hearth cast steel stern post for the United States cruiser "Columbia," now in course of construction by the Cramps. It is claimed that this is the largest steel casting ever made in this or any other country. The casting is in one piece and weighs 49,520 pounds. The same company have contracts for stern posts for the new war ships "Iowa" and "Brooklyn," also to be built by the Cramps, and it is estimated that the weight of each casting will be more than double the weight of the one just completed.

The Improved Industrial Dwellings Company of London have a capital of \$2,500,000, and at the recent annual meeting it appeared that the receipts had been \$530,000 and the expenditures \$216,450. A dividend of 5 per cent. was declared. The company now have 45 estates, with accommodations for 5530 families and nearly 30,000 persons. They are now erecting 42 separate dwellings with money taken from their reserve fund. The death-rate in their buildings last year averaged only 13.3 per 1000, as compared with 21.2 for the entire city. The revenue is constantly increasing.

The Panama Canal Company have been granted ten more years in which to complete their work.



CAST-STEEL STERN POST.

artificially, as previously mentioned, but by making the cylinder of non-conducting material. Glass, lead and certain enamels would approximately serve, if durable. Condensation, however, does not cease after cut-off, for steam condenses as it expands. This is shown both experimentally and mathematically*—the former by using a glass cylinder, in which, shortly after expansion begins, the steam becomes foggy. It should not be assumed, however, that all vapors become foggy when expanding. Ether is an example of a vapor which does not. The difficulty with saturated steam is that it is always ready to condense from the slightest cause, and condensation during expansion can only be prevented, or partially so, by using steam which is so highly superheated that it will only reach the condition of saturation at the end of expansion. This, however, is impracticable.

When initial condensation occurs, the metal of the cylinder stores up heat. When expansion begins, the pressure and temperature of the steam fall and water in the cylinder begins to be evaporated by the heat stored up in the cylinder walls,

* The steam parts with the heat equivalent of the work done, and therefore condenses.

steam, viz.: the "adiabatic" curve. It supposes the expanding steam to receive or lose no heat from or to an external body. This, of course, could only be the case in a non-conducting cylinder. As steam and water are bad conductors of heat, it is probable that the steam in or near the middle of the cylinder expands adiabatically.

Still another curve of expansion is the so called "curve of saturation." It assumes that the steam is always dry and saturated, and by its use one can judge of the change in the amount of water in the steam as expansion goes on. This curve can be constructed by laying off pressures vertically and the corresponding volumes as found in tables of the properties of saturated steam. If, on an actual indicator diagram, a curve of saturation be drawn through the point of cut-off, the horizontal distance between two points on the curves at the same level shows the amount of steam that has condensed, and the corresponding amount of water will be found in the cylinder, provided the actual diagram is within the saturation curve. If it is outside, the difference in volume denotes superheating. On the other hand, for any two points on the curve at the

The Loss Hydraulic Packing.

Hydraulic packing of the design illustrated has been used on a ram 21 inches in diameter at the Pencoyd Iron Works for several months past, the pressure ranging from 1800 to 3000 pounds per square inch, according to the work done. At the same works a bloom shear of the same diameter has been running with water generally so hot that it is barely possible to put the hand on the pipes, and with pressures ranging all the way up to 2500 pounds. On a hydraulic bridge riveter of 10 inches diameter, averaging from 3000 to 4000 rivets in 24 hours, the life of this packing has proved to be six to eight months, under pressures from 1600 to 2100 pounds per square inch. The drawing shows both an internal and external packing, but in the cases above cited only the outside packing was used—that is, where the piston rod formed an extension of the piston and was of the same diameter. Experiments have proved that the friction follows the action of an automatic packing, the amount being a very small percentage of the total pressure. The two forms of packing in most general use for this class of machinery are the ordinary hemp packing and the U-shaped packing. The hemp packing has the advantage that it can be adjusted from the outside simply by forcing in the gland to take up any leakage, but it causes an excessive friction. The U-shaped packing is operated by the pressure of water to form the joint, and the friction that a packing of this kind causes is in direct proportion to the pressure of water in the cylinder. It has no means for adjustment and a local leak cannot be taken up, and the life of the packing is therefore short.

H. V. Loss of 411 Walnut street, Philadelphia, the inventor of the packing here shown, has endeavored to combine the adjustability of the hemp packing with the self-packing feature of the U-ring.

As applied to the piston rod it consists of a ring of some elastic material, having a hole through its center for the passage of the piston rod and having preferably a wedge-shaped cross section.

E is a ring or backing which surrounds the piston rod and is seated within the cylinder casting. The interior of this ring is conical in form and the packing D enters it at the larger end. If preferred, this ring may be turned from and form part of the cylinder A.

F is a sleeve, the forward end of which surrounds the piston and the rear end of which passes over and secures the forward ends of the packing D and backing E.

G is a gland and H a packing of any suitable material—hemp, for instance—which is interposed between the gland G and a shoulder on the sleeve F.

a are grooves upon the interior of the backing E, through which the water from the cylinder, after passing along the piston rod, finds its way to the top of the packing D, and exerts its pressure to close this packing tightly against the piston rod. There may be as many of these grooves as may be found necessary, but six or eight have been found to be sufficient.

In putting the packing into place the ring E is first passed into the seat S, which is formed in the front end of the cylinder casting; the packing D is next passed over the piston rod, its rear end projecting well into the larger end of the backing ring, as shown; the sleeve F is next put into place, and surrounds the top of the backing, and bears also against the forward end of the packing D, while its sides bear against the cylinder and piston rod. The hemp packing H, which prevents any escape of water between the sleeve F and the cylinder A, is then put in place, and finally the gland G is put in place and forced in as tightly as necessary by means of the bolts I and nuts J.

The packing D operates to maintain a tight joint around the piston rod by the pressure of water upon its back. When this packing wears, causing any leak around the piston rod, the gland is forced in further by the bolts and nuts and drives in the sleeve F, which forces the packing D further into the conical backing ring E, and this packing is thereby forced more tightly against the piston rod.

In applying this packing to the piston, it is necessary to have the periphery of the packing instead of its interior bear against the joint to be packed; it is also necessary to use two packings for this purpose, one to pack upon the forward stroke of the piston and the other on the backward stroke.

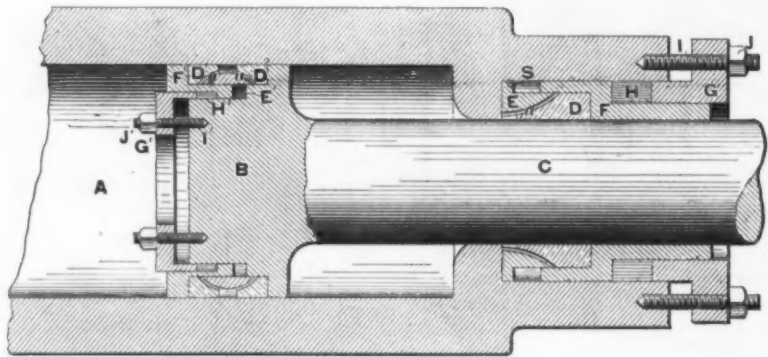
The construction adopted in order to achieve these objects will be understood from the left-hand portion of the drawing which shows the piston and packing in section.

Right of Seller to Hold or Reclaim Goods Sold.

A universal principle of law of the greatest importance to the seller of goods is that which gives him a lien on goods sold for the payment of the price thereof, commonly called a vender's lien. Not

in a year, gave the purchaser a bill of sale of the wood, and received from him his promissory note for the price, payable in six months, before the expiration of which time the purchaser became insolvent. On the one hand, it was contended that the title to the wood had so passed that when the purchaser made an assignment it vested in his assignee. While, on the other hand, it was insisted that notwithstanding the peculiar nature of the transaction, as the wood remained as it originally lay on the seller's premises, it was in his actual possession, and on the purchaser becoming insolvent, the seller had a right to detain it until payment or tender of payment; and this the Supreme Judicial Court agreed in.

A vender's lien may, of course, be waived by express contract, and any agreement which is inconsistent with its retention operates as a waiver of it. His lien is also waived by implication, as when the vender receives some other security for the payment of the price. But a written receipt for cash and notes of the purchaser "in full payment" for property, the title to which has been retained by the seller until payment of the purchase money, does not operate to discharge the seller's lien as against the purchaser's assignee for creditors in the absence of evidence that the transaction was intended as a discharge. And where a note is taken as collateral for



THE LOSS HYDRAULIC PACKING.

only is this recognized at common law, but in most of the States, if not in all, there have been enacted specific laws providing that the seller of goods shall hold a lien for the price over them. But, of course, before this right will arise, the property in the goods must have passed to the purchaser, for a person cannot have a lien on goods belonging to himself. Neither will this lien extend to anything beyond the price of the goods. It will not cover a claim in the seller for storage of the goods, even if it is by the purchaser's default that the goods are kept in warehouse, or other charges are incurred in detaining them. The seller of goods has this lien upon them for their price, unless it is otherwise stipulated, so long as they remain in his possession, and, as against purchasers who become insolvent, until something occurs to make it inequitable for him to maintain it. A seller cannot follow property beyond the purchaser from him, as against the claim of any one, save one who purchases from such purchaser with notice. So if a creditor in good faith takes a mortgage, without notice of the unpaid purchase price of the mortgaged goods, he has a lien superior to a subsequent attachment for the purchase price. One who loans another money with which to purchase property, or pays for the property of another, has no vender's lien or privilege thereon.

A very interesting case arose in Massachusetts, where the owner of a large quantity of wood, which was lying in a pile on his own land, having sold a portion of the same, and measured off and marked the part sold, with an agreement that the purchaser might remove it with-

the price of goods they are, as between the parties, subject to a lien therefor.

However, where one takes, as part of the purchase price, the note of another than the purchaser, it constitutes payment and is a discharge of the purchase money lien. And where one has assigned a note taken as part of the price, and is held only as an indorser on it and has not paid it, he is not in a position to claim a purchase money lien. The lien is also lost where goods have been sold in block for a lumping price, and proof sustains it on a part and fails to sustain it on the rest of the goods, on account of the impossibility to separate the price. It is also lost when goods have been unpacked and mixed with others, so that they can no longer be identified. The object of this lien being simply to secure payment of the price of goods, if the purchaser tenders that it will release them. Actual transfer of possession will also usually destroy the lien, as indicating an abandonment of it; but not always, as courts of equity will aid the seller in cases of insolvency and the like, where innocent third persons are not thereby injured, and in many of the States statutes to this effect have been passed. Where delivery would destroy the lien, merely marking the goods in the purchaser's name, or setting them aside, or boxing them up by the purchaser's orders, and putting his name on them, will not do it, so long as the seller holds them and has not agreed to give credit on them. Furthermore, the retention of open control by a seller's employee over machinery placed in the works of a company, which are being fitted up by the seller, is notice to said company of the existence of a vender's lien.

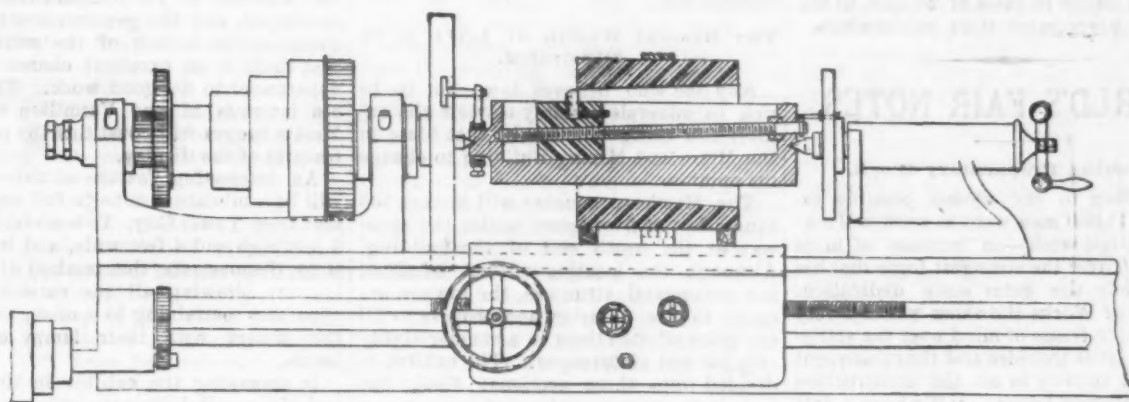
The Quinn Taper Boring Machine.

This tool was designed by Roger Quinn of Philadelphia for boring tapering openings or holes, and is claimed to be the only bar that can be used on a lathe, boring mill or drill press which will bore a taper hole with the centers in the same line. It therefore obviates the present method of setting over the tail stock in order to get the desired angle of taper. The construction of this device is clearly shown in the drawing. The bar is made of steel, with hardened centers, and is formed with a longitudinally extending recess or slot, which is the desired angle of the taper. A tool carrier is fitted in the slot, which is inclined with dovetailed sides. The cutter head is moved down the slot by means of a screw journaled in the end walls of the slot, the screw being parallel with the bottom of the slot. On the end of the screw is a star or gear to feed down the tool, and on the end of the tail-stock spindle is a sleeve, with flange, having pins with tapered ends, which can be moved to and from a circle of small holes in the flange, so as, in conjunction with the star or gear, to regulate the feed of the cutter. Upon every revolution of the bar the screw is caused to rotate on its axis independently of the bar. It will be

testing, this bar is passed through a rolling mill to draw it to its full length; it is then taken to the forge, the swell at the breech end is stamped to the required shape by a steam hammer and afterward straightened cold. The next step is to submit the bar, without annealing, to the turning and drilling machines. The latter are horizontal, the drills operating from each end. In the process of drilling, the barrel revolves at nearly 1000 revolutions a minute against half-round bits held flat down, a capillary tube, of brass, supplying a soap and oil emulsion, at a pressure of 80 pounds to the square inch, to wash out the swarf and cool the cutting edge. The drills advancing from each end continue boring until a small disk about 0.01 inch in diameter breaks out, and the two holes meet. The tendency of the drills to follow the line of axis of a revolving bar is one of those curious occurrences in practical mechanics which might be accounted for after observation, but which no one would predict. Occasionally, through some defect in the steel, a drill wanders from the axial line; in this case the barrel is taken from the machine and reset sufficiently to bring the whole true again. To test its truth, a ray of light is made to illuminate the flat bottom of the hole while the barrel slowly revolves. It is very rarely

edges set at an angle and following one another in the manner of a single-cut file or float. Similar machines have been tried at Enfield, but did not give as smooth a cut as the slower-moving, single tooth machines. A few passes of a lead lap, fed with fine emery, removes any burr that may remain, and completes the polish; a cylindrical lap, spinning rapidly, is then passed through, and gives the final finish to the barrels. The limits of gauging are from 0.303 to 0.305 inch.

Next in importance to the barrel is the mechanism of the breech, for which the material preferred is crucible cast steel of a mild character, but capable of being hardened in those parts exposed to the pressure of the bolt. The body is forged in two operations under the steam hammer; it is then drilled and subjected to a long series of operations, in the course of which the end is recessed to receive the screwed end of the barrel, and the corresponding thread in the recess is milled out in a specially contrived machine, which insures that the thread always starts in the same place relative to the gauged part of the body, a point of great importance. The bolt, also of crucible cast steel, is forged under the steam hammer. A special machine, invented at Enfield, is used to finish the bolt after shaping. After



THE QUINN TAPER BORING MACHINE.

seen that while the tool or cutter bears against the metal there is no strain upon the screw, as the sides of the recess, owing to their dovetailed nature, overhang those of the tool carrier.

The Manufacture of Rifles.

We give below an abstract of a paper read recently before the English Institution of Civil Engineers by John Rigby, superintendent of the Enfield Rifle Factory, describing the manufacture of the Lee-Metford magazine rifle of 0.303 inch caliber, the weapon adopted for the British army:

The most important part of a rifle is the barrel, which has always engaged the special attention of gun makers. Up to the time of the Crimean war it was, for the bulk of British troops, a comparatively rude tube of iron, lap-welded under rolls and tapering externally, with a cylindrical bore of about 4-inch diameter. The barrel of the present day is a steel tube of accurate workmanship, only 0.3 inch bore, almost perfectly true and straight, rifled to $\frac{1}{16}$ inch, and so closely inspected that the existence of the most minute crack or seam in the bore, requiring a highly practiced eye to detect it, is sufficient to condemn it. The material used is produced by either the Siemens-Martin or crucible process of manufacture, and is supplied to Enfield as a solid round bar $1\frac{1}{4}$ inches diameter and $15\frac{1}{2}$ inches long. After severe

that a barrel is rendered waste from bad drilling. Rough boring follows with a three-edged bit, the blade being about 4 inches long. The rough external turning is effected in self-acting lathes, which gives the required curved taper. Three or four cutters act simultaneously, each producing a long cutting that attests the quality of the metal of the barrel. The operation of barrel setting follows. Previous to rough turning, the barrels are fairly straight internally, but the removal of the metal causes slight inequalities which are tested by the eye of the barrel setter, and corrected by transverse blows. This constitutes skilled labor of a peculiar character, and is performed by young men of good sight, who are specially trained for the purpose. After middle life the eye generally loses some of the quality necessary for this work, and it is rare to find a man excel in it after that period. Many mechanical devices have been contrived to supersede the simple ray of light laid, as if it were a straightedge, along the surface of the bore; but the eye still remains the arbiter of straightness, and can be relied on for very accurate results. The construction of the barrel is completed by the important operation of rifling. In British small-arm factories the system is followed of planing out each groove separately with a hooked cutter, and has been brought almost to perfection. In Continental and American factories the grooves are plowed out by cutters, with several cutting or knife

machining, the bolts, packed in wood charcoal in iron cases, are heated and hardened by immersion in oil. The temper of the handle is then reduced in a lead bath. The rest of the bolt is tempered straw-color. The bolt head is similarly hardened and tempered.

The other components of a complete rifle are mostly shaped by mills built up to the proposed profile, or by copy-milling machines. The process of drifting is used with good results at Enfield. All such slots or perforations as have parallel sides, and are not cylindrical, are so finished. The common practice in drifting is to push the drift, but at Enfield much better work is accomplished by pulling. It is found that used in this way drifts are very valuable for interchangeable work. The sides are cut with successive teeth, each slightly larger than the preceding one, and the whole length of the drift is drawn through. Emery wheels are also largely used at Enfield as a substitute for finish milling and filing. The wheels run under hoods connected with a pneumatic exhaust that carries away the heated particles of steel and grit. It is popularly supposed that a machine once adjusted to turn out a component of a certain size and shape is capable of reproducing such in large numbers, all absolutely identical. This is so far from being the case that no die, no drill and no milling cutter actually makes two consecutive articles the same size. The wear of the cutters or dies proceeds slowly but

surely, and it is only possible to produce in large numbers components of dimensions varying between a superior and an inferior limit. In small-arm manufacture a variation of about $\frac{1}{1000}$ inch is about the amount tolerated, but it varied according to the size of the piece. A difference of diameter of $\frac{1}{1000}$ inch in the sight axis hole, and in the size of the pin or axis, causes a serious misfit, whereas a similar difference in the measurement of the magazine, or of the recess in which it lies, is quite immaterial. The operations of gauging, proving the barrel, and sighting were successively described, as also the manufacture of the stock, which is of the wood known as Italian walnut, though largely grown in other countries. Among the smaller components, the screws were mentioned as being rapidly produced by the automatic screw-making machines of the Pratt & Whitney Company.

The component store receives the various finished parts, which number 1591, or, including accessories, 1863, and issues them to the foreman of the assembling shop. Theoretically, the assembler should have nothing to do but to fit and screw them together, but in practice small adjustments are found necessary. The amount of correction is generally exceedingly small, and is done wherever possible with the aid of emery wheels. The completed arms are submitted to inspection and then issued in cases of 20 each to the Weedon government store or elsewhere.

WORLD'S FAIR NOTES.

Pushing Preparatory Work.

According to the closest possible estimates, 15,000 men went to work at Jackson Park last week—an increase of more than 1100 over the strongest force that has been inside the gates since dedication. Director of Works Burnham was in a very comfortable frame of mind over the settlement of labor troubles and the subsequent increased activity in all the construction and installation forces. "We have a full force in the department of works," he said in answer to a query, "and are moving along all right. I should say we had 3000 men of our own besides the labor employed by contractors on Exposition work. That includes the landscape, installation, color and carpentry divisions. The contractors have all their old men back and a good many more besides. It would be hard to say without an actual count just how many men are at work inside the fence and on the Plaisance, but it is enough to make things move along at a lively pace." Mr. Burnham's cheerful view of the situation was shared by the contractors and the returned strikers as well. One of the union employers made an estimate that showed a complement of nearly 15,000 men in all grades of labor, both union and non-union.

Exhibits Received Until April 30.

Director General Davis has issued the following general order:

"Notice is hereby given transportation companies and exhibitors in the World's Columbian Exposition that all exhibits for which permits for space have been issued and which can be delivered and placed in position and the exhibitor's work completed on or before April 30, 1893, will be admitted, and the regulation fixing April 10, 1893, as the last day on which exhibits will be received is hereby modified to that extent."

The original regulation modified by this extension, provided for the forfeiture of all space not occupied by the holder of the allotment by April 10. It has been apparent for some time that some of the exhibitors, notably in those departments

where installation has been delayed by leaking roofs, would have to be given that time or else suffer injustice by forfeiture of the apportionment. The time fixed for installation, April 10, was made early enough to provide for the emergency that has arisen. "The order," said the Director-General, "is only a formal permission for an extension that everybody knew would come during the last weeks of installation. It has been so at every exposition and we expected it here. It does not mean that the exhibits are unexpectedly slow in arriving, as some might construe it, for we are considerably in advance of the stage they had reached at Paris or the Centennial 20 days before the opening. We did not want any exhibitor to feel that he would be barred from participation because he had been delayed beyond the time set for him to be here. So far as may be judged this far before the opening, the work of installation is very well advanced and is progressing well. In manufactures alone 15,000 packages have been received and placed in the proper space, and that is perhaps the best test of progress, because the exhibitors of the department were comparatively late getting their official allotments. In agriculture, mines, electricity, transportation, fine arts, floriculture and horticulture exhibits are coming in very fast, and we see no reason to qualify anything we have said as to our readiness on opening day."

The Mineral Wealth of Iowa to be Illustrated.

Any one who believes Iowa not to be rich in minerals has only to view the exhibit now being erected by that State in the Mines and Mining Building to change his opinion.

The Hawkeye country will occupy 526 square feet of floor space under the stairway at the south end of the building. Although the location will not admit of any ornamental structure, the Iowans are equal to the occasion and propose to fill the space allotted them in a manner highly original and picturesque. The exhibit is divided into three sections: Coal, the technical display and miniature scenes from mines and quarries. The exhibit is being prepared by T. W. Meers of Centerville, and is constructed to satisfy geologists and to please disinterested spectators as well. In the center of the space will be shown an interior of a coal mine. This will contain a loaded coal car and several life-size figures of miners at work. Although the space is only 25 feet deep the perspective is arranged to make the mine appear to extend back several hundred feet. Over the entrance of the "pit" will be the word "Iron" worked out in coal and other minerals. The mouth of the "pit" will be built up of blocks of coal so that the entrance will appear to be through a solid block of bitumen.

On the right of the coal exhibit will be the technical display, including fine specimens of every mineral found in the State. A great store is set by the exhibit of Trenton rock and lead, which took the first medal at New Orleans. On the left will be a reproduction of the Ottumwa mineral palace set upon a pedestal of coal. The pedestal will be divided into squares and each square will contain the name of a mineral county in letters of gold. In this division there will also be a model of an exterior coal mining scene. This is built of black walnut lumber and was contributed by the ladies of Centerville, who were patriotic enough to have engraved upon the model "Iowa" instead of Centerville. A solid block of coal weighing 5000 pounds will be set up in this section, upon which will be printed in gold the Iowa mineral statistics. The ladies of Dubuque have built a grotto out of stalactites and spar, which will be erected at the extreme left of the Haw-

eye space. This grotto is also arranged by means of lookingglasses to appear deeper than its actual size warrants, and it is a beautiful creation from a decoration standpoint. It will be fitted up with electric lights and will form one of the features of the exhibit. The different clays, glass, sands, and kaolins will be shown in glass jars. A special exhibit of vitrified brick will be made. Among the counties contributing to the exhibit are Alamakee, Dubuque, Jasper, Sergeant, Red Oak, Webster, Clayton, Eldora and Appanoose. Appanoose has 80 coal mines in operation and furnishes the greater part of the coal used in the exhibit. Many minerals will be shown, including red jasper, Galena limestone, magnesia limestone, iron oxide for manufacturing mineral paint, silica, zinc ore, black jack, and clay for vitrified brick.

Minnesota's Mineral Exhibit.

A feature of the natural wealth of Minnesota which is not fully appreciated will be illustrated by means of a fine display in the department of mines and mining. This exhibit will be under the direction of L. P. Hunt, general superintendent of all the exhibits, and H. B. Moore. These gentlemen have secured specimens of all varieties of ore mined in the State, and each mine that is in operation will have a distinct exhibit. The mineral interests of the State are as yet comparatively little developed, and the gentlemen who have charge of this branch of the exhibit feel that there is an excellent chance in their department to do good work. The iron-ore interests of the Vermilion and the Mesabi ranges will constitute the principal features of the display.

An interesting feature of this exhibit will be a miniature mine in full operation, sent from Tower City. This model is about 6 feet high and 4 feet wide, and its object is to demonstrate the method of mining iron ore, showing all the various levels, apparatus pertaining to a mine, and even the miners with their lamps on their heads.

In arranging the exhibit in the Mines and Mining Building the stone work that was necessary was constructed of Minnesota stone, each block being labeled, showing from what quarry it was taken. Good granite and sandstone are plentiful in that State, and with samples from each quarry of prominence placed in practical use the merits of the different grades can easily be seen.

Nicaragua Canal Model.

The great model of the Nicaragua Canal is unpacked and nearly ready for exhibition. It is about 35 feet long and 5 wide, and gives a bird's-eye view of the oceans, mountains, jungles, rivers, lake and harbors, showing the advantages of this route for interoceanic communication.

In order that nothing may be left for the imagination the model is so constructed that water will cover the oceans and lake and fill the canal and river. Standing by the model one may study the formation of the harbor at Greytown, on the Atlantic coast, then follow the canal traversing the swamp lands at sea for ten miles, until it reaches the foot of the coast range. Here it climbs up the hills 100 feet by three locks, entering a series of lagoons on the Limpio and San Francisco rivers, which form natural channels to the great San Juan, the Ohio of Central America.

At this point the Ocho dam will raise the waters of the great river to a level with its source, Lake Nicaragua, giving slack water navigation to the inland sea.

From the lake to the Pacific Ocean the distance is only 12 miles, and the highest pass only 45 feet above the lake level. The canal passes about 4 miles south of the city of Rivas, where Gil Gonzales de Avila first met the natives of Nicaro in 1525, and

kept his Spanish soldiers busy for a week baptizing the simple Indians at the edge of the "sweet water sea." About half way to the ocean the ships will enter the artificial lake of Tolo, then go down 110 feet by three locks into the quiet waters of the Pacific at the harbor of Brito.

In the Manufactures Building.

On the mammoth floor of Manufactures Building are collected 34 large groups, or subdivisions, of the department. These are divided into more than 200 classes of leading industries. These figures are given to show the scope of the department, which embraces the entire product of modern machinery and the skillful handiwork of man in every design and form. In finish, and especially in the patient, laborious processes of manual labor, it is conceded that the foreign exhibitors may excel at the World's Fair. But in variety and in originality it is just as certain that the United States exhibit will surpass those of foreign countries. Keen rivalry has led to many competitive exhibits from the leading manufacturers of the United States. The department officials have insisted that each exhibit from domestic houses shall typify some special industry, and that there shall be no huge displays which depend for merit on the amount of space occupied.

Encircling the vast building on all four sides are spaces devoted to offices, restaurants, concessions and the various appliances for public comfort. There are continuous promenades outside in the covered loggia. Every known public convenience, including seats along these promenades, will be arranged. In the center of the building, along Columbia avenue, there will be a series of elevators to carry passengers to the outside of the main roof, where a promenade balcony will extend on all four sides of the building.

The lighting of the interior at night has been planned on a scale that will astonish even those familiar with modern electric lighting methods. Along Columbia avenue there will be monster chandeliers suspended from the roof trusses. Each of these chandeliers contains a cluster of arc lights. The light above the floor—about 140 feet—will enable them to throw a brilliant light over all the gallery space and the main part of the lower floor. On the latter, along the various streets and avenues, are a series of arc lights, mainly suspended from the galleries, which will light up all parts of the ground floor. The exhibitors pay for the special lighting of their pavilions and, in many instances, they attain superb artistic effects by a liberal use of the incandescent system.

Most of the exhibits are housed in exquisite pavilions. In some groups this interior architecture observes a prevailing key throughout. Thus in the German exhibit the prevailing style in all the minor booths, as well as the grand façade in front, is the Renaissance of architecture, the rococo decoration being profuse and frequently gorgeous. In the French exhibit, on the section diagonally opposite the German exhibit, the style of architecture is severely classic throughout. The arches and columns in every portion of the French section show a uniformity of design and great *finesse* in execution. In the English section and also the United States section this uniformity of design in the pavilions is lacking, although there are many individual structures of great beauty.

The Germans and French have built their structures under direct governmental supervision and with government moneys. The United States exhibitors, on the other hand, have had no concert of action, and there is little uniformity of design in the installation of exhibits, except in so far as the exposition officials could prevail upon individual exhibitors to build pavilions

and install exhibits in a compact and striking way. The foreign commissioners subordinate individual exhibitors to a general plan, but the Americans have yet to learn this method of installation and the necessity of providing money to carry it out successfully.

The quadrangle formed by the American, German, French and British sections on the ground floor has a central point, where all four meet. This point is exactly in the center of the building. Between the various façades which form the initial point for entering each of these sections there is a central court. Within this court rises the crowning spectacular exhibit of the entire building. This is a highly ornamental tower of staff work, built by Nelson Brothers and designed by Sanier for the exposition authorities. Near the top of this tower will be placed the master clock of the exposition, which is an exhibit by the Self-Winding Electric Clock Company of New York. There will also be a chime of bells, which will ring out the hours.

The northeast section of this central court is occupied by the most pretentious structure containing a United States exhibit. This is built by three New York firms—Tiffany & Co., the Gorham Mfg. Company and the Tiffany Glass & Decorating Company. The architecture is Doric, the color being white, with gold ornamentation. There is a curved façade, and the building itself is about 25 feet high. From the center of the front there rises a Doric column, surmounted by a globe and crowned by an eagle 100 feet above the floor. There are two lesser columns 40 feet high on either side, and wide arches between the columns which span the entrances to the interior exhibits of jewels, gold and silverware. At the base of the main shaft is a pedestal with an inscription which declares that this section of the building is devoted to United States exhibits. The ornamentation and symbolism are all emblematic of America.

The pavilions erected by the Hindostanese and the Ceylonese are the admiration of all who see them. No such specimens of wood carving were ever before seen in this country. Delicate tracery and carving in satin woods and ebony are profusely used to ornament the columns and arches. The wood carvings which will be shown in the interior exhibits from these countries are the products of the most skilled native workmen in either country, and therefore the finest exhibits of their kind in the world.

When the visitor enters the United States section one of the first impressions will be the wondrous variety and comprehensiveness of the manufacturers' exhibit. Before examining the details of the several exhibits the visitor will be well repaid for a study of the exterior ornamentation of the several booths and pavilions. Perhaps the most exquisite of all the American pavilions, from an artistic point of view, are those of the Pairpont Mfg. Company and the Meriden Britannia Company, both being exhibitors of silverware. The Pairpont pavilion is a miniature Grecian temple, pure white in color, its splendid proportions being a model of classic architecture. The Meriden pavilion is circular in shape and constructed entirely of rosewood. Other very handsome pavilions in the American sections are those of Edward Jansen, who exhibits toys in the gallery, and Mermod & Jackquard, who exhibit jewelry, also in the gallery. These are gems in the Renaissance style of architecture. There are many Byzantine kiosks and other miniatures of ancient structures in various portions of the American sections.

There are also several collective exhibits in the department of manufactures. Among the more striking of these may be mentioned the exhibits of the National

Association of Woolen Manufacturers, the Association of Silk Manufacturers of the United States, the National Pottery Association, the Wall Paper Manufacturers, the Merchant Tailors' Association and the Shoe and Leather Association. The two last mentioned exhibits are outside of Manufactures Building in special structures. The merchant tailors' exhibit is in an artistic building between the Art Galleries and the Illinois State Buildings, and faces the northwest lagoon. The interior decoration of the Merchant Tailors' Building is magnificent. There are panels with water color paintings by distinguished artists, typifying six stages of dress from the time of Adam to the present day. The other overflow exhibit—shoe and leather—is in the southeast portion of the grounds. This building is 570 feet long by 150 feet wide, and cost more than \$100,000. It will contain the domestic exhibits of leather, boots and shoes, rubber boots and shoes and the allied trades, besides the exhibits of leather from foreign countries.

House of Many Woods.

Oregon has adopted a unique and practical method of displaying the woods produced in that State. At Jackson Park there is now being erected a house constructed entirely of Oregon woods. It is to be 10 feet square and 19 feet high, and will be surmounted by an open cupola. The body of the structure will be of yellow pine. The roof, which will be of red cedar shingles, will be supported by four Doric columns. The columns are of maple and are very richly carved. The roof of the cupola will also be supported by four small Doric columns of carved oak. The exterior will be furnished with panel work containing about all the woods of the State, among which are manzanita, madrone, yew, laurel, myrtle, ash, maple, oak, spruce, balm, fir, sugar pine, bird's-eye pine, cherry, curly maple and alder. The house will form the Oregon pavilion in the Forestry Building.

Honoring Mr. Dredge.

At the session of the Board of Directors on the 13th inst. the following preamble and resolutions were adopted:

Whereas, James Dredge, Esq., of London, England, has, from the inauguration of the work of preparation for holding the World's Columbian Exposition, rendered invaluable service, both in Great Britain and on the Continent, in making known its plan and scope, with which he was at pains to make himself thoroughly familiar, giving to the enterprise the influence of his eminent professional knowledge and experience as an engineer and journalist, thus aiding substantially in securing the participation in said International Exposition by the governments and peoples of Europe; therefore, in testimony of our high appreciation of the services so rendered, be it

Resolved, That the thanks of this body are due and are hereby tendered to James Dredge, Esq., for his able and continued efforts in promoting the interests of the World's Columbian Exposition; be it further

Resolved, That an engrossed copy of the foregoing preamble and resolutions, duly authenticated, be forwarded to Mr. Dredge.

Cramp & Sons and Cope & Co., manufacturers of Philadelphia, remonstrate in the local court against the granting of licenses to sell liquor in the vicinity of their works, alleging that they are a fruitful source of accident, incompetency and demoralization among the men they employ.

Superintendent Hannan telegraphs that the Erie Canal will not be open before the 8th or 10th of May.

Annual Report of the General Electric Company.

The first annual report of the General Electric Company was issued last week. The organization embraces three underlying companies—namely, the Edison General Electric, Thomson-Houston Electric and the Thomson-Houston International Electric. They still retain their independent corporate existence. The General Electric Company purchase and distribute the chief part of the goods manufactured by them. The company have about 6000 customers. The total number of central stations using their apparatus is 1277, supplying 2,500,000 incandescent and 110,000 arc lamps. Those plants which have been established longest are making the most rapid increase in size and volume of business. The railway organizations of the company are as follows:

Railway Companies.

	Feb. 1,		
	1891.	1892.	1893.
Total number of roads operating and under contract.	151	214	435
Total number of cars in actual operation.	1,578	2,700	8,386
Number of miles of road in actual operation.	1,252	2,315	4,927

During the past eight months the company have increased the size of their individual machines from a maximum of 275 horse-power to 2000 horse-power, and 2000 incandescent lights to 12,000 lights. The most satisfactory progress has been made in the development of machinery for mining purposes, especially for motor-power. Thirty locomotives are now under construction.

The relation of the company to their various licensees is close. They recognize that their own prosperity in a measure depends upon the prosperity of these interests. The efforts of operators to develop an incandescent lamp not an infringement of the company's patents have thus far been wholly without success, and there is no reason to believe that any different results will be achieved in the future. Suits against infringers are now in active progress and will be vigorously pushed. The company are supplying to about 1300 local companies, royalties from which run from \$1,500,000 to \$2,000,000 per year. It is believed that they will greatly increase in the future, so that \$8,000,000 will appear to be far within the actual value of the patents, contracts, &c., which are represented thereby. The United Electric Securities Company are making large profits and paying regular quarterly dividends. The Canadian General Electric Company are now under operation for a sale to a Canadian syndicate at prices above par.

Fort Wayne Electric and Northwest General Electric are paying 8 per cent. dividends on the value at which they stand in the balance sheet. Stocks of local companies valued at \$5,772,622 have a par value of \$11,362,011. The inventory value is a figure which could be easily obtained for them. The cost of patents acquired by the company during the past eight months has been charged off as a past operating expense.

The balance sheet of the company January 31, 1893, is as follows:

Assets.—Investment Accounts.

Stocks of underlying companies:	
Thomson-Houston Electric Company.	\$8,416,852
Edison General Electric Company.	8,633,208
Thomson-Houston International Electric Company.	1,212,000
	\$18,262,060

Real Estate, Edison Building, New York City.	\$410,805
Less mortgage thereon.	200,000
	\$210,805
Other real estate.	87,922
	\$298,727
Stock of United Electric Securities Company:	
Preferred (par \$454,300).	\$408,870
Common (par \$825,500).	825,500
	1,234,370
Stocks of manufacturing and other companies:	
Canadian General Electric Company (par \$1,000,000).	\$1,000,000
Excelsior Electric Company (par \$6000).	1,300
Fort Wayne Electric Company (par \$704,700).	352,350
Northwest General Electric Company (par \$155,000).	155,000
Miscellaneous Companies (par \$481,033).	71,566
	\$1,580,216
Total.	\$21,375,373

Other Assets.

Stocks and bonds of local companies:	
Stocks (par \$11,362,012).	\$5,772,622
Bonds (par \$4,853,380).	3,400,629
	\$9,173,252
Cash.	\$3,871,034
Notes receivable.	5,151,951
Accounts receivable.	7,078,879
	\$16,101,863
Inventories.	\$2,307,225
Less 10 per cent.	230,723
	2,076,503
Work in progress.	2,207,982
	\$29,559,601
Total.	\$50,934,974

Grand Total.

Liabilities.

Capital stock:	
Common.	\$30,426,900
Preferred.	4,286,900
	\$34,663,800
5 per cent. gold coupon debenture bonds.	10,000,000
Other liabilities:	
Accrued interest on debenture bonds.	83,333
Dividends declared, but unpaid.	608,538
Notes and accounts payable.	4,554,348
	\$5,246,219
Surplus January 31, 1893.	1,024,955
Total.	\$50,934,974

Profit and Loss.—Earnings.

Interest and discount.	\$89,518
Interest on debenture bonds.	152,917
Dividends paid and dividends declared, but not yet paid.	1,971,056
Patents, now charged off.	118,151
Surplus, carried forward.	1,024,955
	\$3,356,533
Total.	\$3,356,533
The net profits from the business of the eight months ended February 1, over and above all expenses, deductions for bad debts, &c., were.	\$3,356,533

From an engineering exchange we learn that a process of recovering tin from clippings of tinned iron has been devised by M. Lambotte of Brussels. The clippings are introduced into a vertical cylindrical furnace, which is surrounded by a spiral. Air charged with chlorine gas passes through the spiral, where it is heated by the heat of chemical action going on within the furnace and, entering the furnace below, passes through the clippings. The tin is attacked and stannic chloride is formed, which volatilizes and is subsequently collected upon condensing surfaces moistened with a solution of the same chloride. The iron is not attacked, and when entirely cleaned from tin is re-

moved from below and again used. At the Molenbeck works of M. Lambotte some 2,500,000 pounds of tin clippings are annually treated by this process.

Financial Crisis in Australia.

Advices from London and Australia indicate that a new factor must be taken into the account if the shrewd business calculator would attempt to forecast the financial future. Enormous amounts of British capital have been absorbed by speculative enterprises in all the Australian colonies within the last few years, until at last the entire fictitious fabric is threatened with collapse, the utmost limit of expansion having been reached. Disasters have followed each other in quick succession until we hear through a cable dispatch from London that the English, Scottish and Australian bank, chartered 40 years ago, has failed with liabilities which are believed to equal \$40,000,000. The suspended bank has main branches at Sydney, Adelaide, Brisbane and Melbourne and at various lesser points in the Australian colonies and had large deposits. This suspension, following so quickly after the collapse of the Commercial Bank of Australia, with deposits of about \$60,000,000, has added to the anxiety caused by previous recent failures of large institutions with Australian connections, and though the bank may have had no direct dealings with firms and institutions in the United States the financial revulsion in Argentina and the Barings' failure shows that British and American interests are closely allied, and that when disaster occurs in any direction all are more or less affected in sympathy. Considered in connection with the reported failures in the Liverpool cotton trade, and giving due weight to the labor troubles in the British Shipping Federation and in Belgium, it will not be strange if the foreign buying of American investment securities is discouraged, synchronizing unfortunately with our adverse balance of trade and for which at present no effectual remedy is in sight.

The financial crisis which seems to have overtaken the Australian colonies, New Zealand excepted, is but the culmination of a system of reckless borrowing for the prosecution of public works and other forms of expenditure, confessedly for the purpose of giving employment to the laboring classes as a primary object, until at last, soon after the beginning of the year 1893, the uneasiness prevailing in regard to the public treasuries constrained the banks in New South Wales, Sydney and Melbourne, to withdraw from all connections with speculative enterprises of whatever kind. The contraction in Melbourne in February last, as compared with February, 1891, as shown by Clearing House returns was no less than \$74,000,000, and this may be taken as a fair index of the course pursued at other financial centers. But the brakes were put on too late to avert the impending catastrophe, the colonies having been drained of gold continuously for a long period for remittance abroad in payment of interest and material purchased, for example, in railroad construction. Deposits sank to a very low ebb. The proffer of mutual assistance by the associated banks availed little when the emergency arose. The failure of the Federal Bank of Australia was hardly a surprise, and misfortunes on a larger scale since recorded cannot be said to have been wholly unexpected by those in the trade. The situation in Australia was very fairly represented in these columns three weeks ago by Mr. Douglass of the firm of Arkell & Douglass, who recently returned from that country, and stated that "the Australasian Colonies, owing to over importations, land specula-

tions, want of emigration, also trouble with the working men (controlled by trade unions), and a too free borrowing of money, are in a rather depressed condition and not making the headway they should."

The fact is too evident to admit of disguise that the process of recuperation from the depression now felt at the Antipodes may be protracted and operate seriously to discourage commercial enterprise, which has already developed far in advance of the requirements of the population upon which all material progress depends.

The responsibility for very much of this mischief rests upon unconscionable London capitalists who, in their greed to realize an exorbitant rate of interest, are too ready to sanction if not directly to encourage any wildcat scheme having the semblance of legitimate enterprise.

The Production of Open-Hearth Steel.

According to the American Iron and Steel Association the production of open-hearth steel ingots in the United States in 1892 was 669,889 gross tons, against 579,753 tons in 1891, and 513,232 tons in 1890. There was an increase of 90,136 tons, or over 15 per cent., in 1892 as compared with 1891. The production of 1892 was much the largest yet attained in this country. Our production of Bessemer steel ingots in 1892 was 4,168,435 gross tons, or more than six times as great as our production of open-hearth steel in the same year. Nevertheless our open-hearth steel industry has made steady progress in recent years. The production of open-hearth steel in 1892, in New England, New York and New Jersey amounted to 38,131 gross tons; in Pennsylvania to 551,010 tons; in Ohio to 60,834 tons; and in the other Western, Pacific and Southern States to 19,914 tons.

The open-hearth steel made in 1892 was produced by 63 works, located in 12 States—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Alabama, Ohio, Indiana, Illinois, Michigan, Missouri and California. The total number of completed open-hearth steel works in the United States at the close of 1892 was 80, or nine more than at the close of 1891.

The quantity of open-hearth steel rolls produced in 1892 was only 3,819 gross tons, nearly all being made in California.

The production of open-hearth steel in Great Britain in 1892, published by the British Iron Trade Association, was 1,418,830 gross tons, against 1,514,538 tons in 1891, and 1,564,200 tons in 1890. The production of Bessemer steel in Great Britain in 1892 was 1,500,810 gross tons, against 1,643,005 tons in 1891 and 2,014,843 tons in 1890.

The time for the annual settlement of wages for the Amalgamated Association of Iron and Steel Workers is now drawing near, and the local leaders at Youngstown, Ohio, are beginning to consider the changes they will recommend. This year promises to be an eventful one to organized ironworkers. The fact that the finishers have organized separately and will demand recognition from the manufacturers and present their own scale, the Amalgamated Association, on the other hand, will not recognize the finishers' union, and there the first complication is going to arise. The manufacturers, it is a foregone conclusion, will demand a reduction in the price of puddling or boiling. Last year it was attempted to reduce the price to \$4.50 or \$5, but the association succeeded in keeping it at the old figure by making concessions which affected the finishers and brought about this division in the ranks of organized iron laborers. Steel is rapidly succeeding iron, and the

puddler is slowly but surely becoming a thing of the past. Last year the product of the puddling furnaces fell off nearly one-fourth, and the indications are that the decrease will be greater this year. The manufacturers will make their principal fight over the puddling rate and seem confident of forcing a reduction, as they maintain that the displacement of iron by steel, and a consequent decrease in the output of the former, is due to a great extent to the high price maintained. That there will always be puddlers, goes without saying, but that their day is past seems equally apparent. That this will work great hardship to thousands who have no other occupation, and are too old to acquire a new one, is also apparent. For this the iron and steel manufacturers can not be blamed. It is one of the results of the prodigious forward strides that science is making in the practical art. The first annual convention of the Finishers' Association will be held at Youngstown, Ohio, May 6, and their scale will ignore the puddlers. The Amalgamated Association will hold its convention in Pittsburgh on the first Tuesday in June, and will no doubt disregard the finishers.

Gold Exports.

The exports of gold from this country since January 1 to April 17 inclusive have aggregated \$43,194,760. The net exports during the same period were \$37,382,576. The shipments for the week ending Saturday, April 8, was \$4,250,000. The exports, inclusive of Tuesday's consignments in this week, was \$1,750,000. This movement of gold is in liquidation of our trade balance. For seven months ending January 31, 1893, the total merchandise imported into this country was \$528,244,244, against imports during a like period in 1892 of \$458,394,471, an increase of \$89,849,773. On the other hand, our exports during seven months were \$519,021,037, against \$643,345,857 during a like period in 1892, a decrease of \$124,284,820. This means that we have not only created obligations amounting to the last-named sum in excess of those which were created last year, but we have through a decrease in exports diminished our purchasing power nearly \$90,000,000. These totals are very suggestive, inasmuch as they indicate a healthy degree of prosperity in this country, and just the opposite condition of affairs in Europe. In examining the Custom House returns we find that this increase in amount of imports is in a measure due to appreciation of valuation. Thus India rubber importations, while showing no material increase in quantity, appreciated about \$5,750,000 in value. The increase in coffee amounted to about \$18,000,000; raw silk importations, \$5,000,000; precious stones, \$1,750,000. From this brief statistical showing the primary cause of gold exports can be deduced.

There is no doubt that our importers, owing to the gold scare of several months ago, as well as the anticipated congestion of traffic during the World's Fair, have hastened invoices and have paid for them promptly. This in a measure has discounted future action, and will be apt to exert a beneficial influence on the business of the country at a later date.

Six weeks ago, during the money stringency and attendant high rates, exports of gold were entirely stopped, foreign capitalists preferring to lend money in this country at a high rate of interest rather than be encumbered with it at home. As was prophesied, as soon as interest rates fell off to a normal basis the gold movement was resumed, and, judging from the present condition of trade, bids fair to continue into the summer.

The termination of the Lancashire cot-

ton strike was expected to stimulate the buying of American cotton, placing on this market a large number of bills. This, however, has not been the case. The recent manipulations of the Chicago wheat pool, which succeeded in bulling the price of May wheat to 90 cents, had the effect of causing foreign buyers to leave the New York market. As yet their return has not been chronicled.

The action of Secretary of the Treasury Carlisle in ordering the suspension of the payment of gold certificates for gold deposits has been the topic of universal discussion in financial circles since Saturday. Heads of various banks and other financial institutions with whom we have talked say that the action, which was compulsory and not arbitrary, inasmuch as it was demanded by law, does not foreshadow ominous conditions. The effect will simply be this: Instead of being a depository for gold, issuing gold certificates therefor, and thus creating an obligation against the gold on hand, the treasury will still continue to take the gold, issuing therefor legal tenders which do not necessarily call for gold. Consequently, the net gold in the treasury will be increased. Its bearing upon the treasury, aside from the fact just cited, is insignificant, inasmuch as the holder of these same legal tenders can, upon demand, obtain gold therefor. The condition which is giving the financial world much greater concern is the probable action of Secretary Carlisle when the \$100,000,000 reserve fund is cut in upon by gold exports. At the present time there is but \$500,000 margin. A similar condition was reached a number of weeks ago, at which time the bankers came to the relief of the treasury, depositing gold, taking therefor legal tenders. It is not believed that this policy will be repeated. Leading financiers believe that it is necessary for the administration to speedily define a policy, and that such action will not be taken until it is practically forced. An intrenchment upon this gold reserve will compel President Cleveland to either acknowledge the expediency of abolishing the gold reserve and the sentiment attached thereto by using it, or force an issue of bonds to preserve it. In either event, the climax will be reached, and it is believed, to the benefit of the commercial and financial world.

Wall Street prefers a bond issue of considerable size floated abroad, being firmly of the belief that such action would turn the tide of gold toward this country, and re-establish confidence in Europe. This latter event would stimulate the buying of our securities, the investment of money in our industrial enterprises, and create activity in our commercial centers.

Advises received from Washington on Tuesday were to the effect that the Secretary of the Treasury will issue an order that the \$100,000,000 gold reserve fund must be preserved for the legal tender notes, and that it shall be used for that purpose only. This puts about \$130,000,000 treasury notes on a silver basis. It is considered by those in touch with the present administration that such action if taken would be part of the general policy of putting things in their proper light. The \$100,000,000 would then be reserved for the reduction of greenbacks and would be freely used for that purpose.

The German Patent Office received last year 13,126 applications and granted 5900 patents, as against 12,919 applications and 5550 patents in 1891. Thus 55 per cent. of all the applications, on which fees had been paid, were rejected.

Mexico's new railroad law governing freight charges went into effect on the 15th inst.

THE WEEK.

The damage inflicted upon the trade and commerce of the United States by the Chinese exclusion act and the feeling of estrangement that has sprung up between the two countries could be computed only by millions of dollars. Although imports of tea and raw silk continue on an augmenting scale, exports steadily decline. The Chinese demand for American manufactured cottons is scarcely noticeable in the direct trade. For various reasons it is a source of satisfaction that the Supreme Court, at a session which is likely to be held in Washington next month, is expected to decide the question that has existed from the beginning respecting the constitutionality of the hostile legislation directed against the subjects of the Chinese Empire. The representations of the Chinese Government against the drastic and arbitrary features of the act have been so strong that the Executive Department has decided to make an early test case.

In all 82 vessels have changed hands in Cleveland during the past winter, aggregating about \$2,700,000 in value and including some fine property. Besides the sales of vessels, many individual interests have been transferred.

The third cargo of West Virginia coke has been shipped from Baltimore to Mexico, via Tampico, for smelting purposes.

Farmers in North Carolina are this year giving special attention to hog production.

In Tennessee dealers in futures are taxed \$50,000 per annum, under a new law.

The entire trade between Canada and Australia does not represent much more than the cargo of a single round voyage, and yet, with the aid of a Government subsidy, the plan is to maintain a monthly service between New South Wales and British Columbia. Incidentally Honolulu will be kept in close communication with the British Empire.

Petroleum is discharged at Madras by means of flexible rubber tubes.

Explaining the downfall of McLeod, who proves to have been altogether too ambitious and too sanguine in reaching out for the control of New England trade, the *Philadelphia Press* says: "Some facts as to the items of expense during the last year or so are not generally known. The Port Reading Road cost about \$500,000 more than was expected and the Reading has been compelled to expend, by reason of the Lehigh Valley lease, about \$1,500,000, which was also unexpected. It is also said that the entrance to the Coxe mines and other items took \$1,000,000 more than was anticipated, and that \$1,000,000 was spent in equipment. Here, then, is an extra expenditure of \$4,000,000, the most of which was not foreseen. At the same time stock of coal on hand jumped in value from about \$3,000,000 to \$8,000,000, and this required the addition of just so much capital."

Speaking of the commercial barriers that exist between the United States and Canada, the plea that while Canada would be a desirable market for our manufactured goods she would pour across the boundary crude products to an extent that would drive American farmers out of business does not seem to be well founded. In the fiscal year 1892 the breadstuffs we sold to Canada amounted to \$11,401,494, while the amount we bought of her was only \$3,673,343, a condition of trade that ought to make the American farmer content to see the barriers somewhat reduced.

The fleet of vessels wintering in Chicago which have loaded cargoes of grain

or which will do so is larger than that of any previous year. Capacity for nearly 9,000,000 bushels of grain has been chartered and when loads for many large steamers which have wintered in Milwaukee and which are almost daily arriving have been taken, the total will not be far from 10,000,000 bushels.

The port of Conneaut on Lake Erie will receive many cargoes of ore this season from the Mesaba mines. The unique feature of the new port is that the hoisting and conveying on the docks is all to be done by electricity.

Sisal fiber, similar to that grown in Central America, is now produced with good commercial results in the Bahama Islands under the stimulus of a bounty. It sells in London at \$130 per ton; the price of Manila and Yucatan is \$100 per ton.

There arrived at Quebec last year 379 ocean steamers, comprising 753,000 tons.

Governor Crouse of Nebraska has signed the Newberry Maximum Freight-Rate bill, which cuts rates 20 per cent. The law goes into effect July 1 next.

The large coffee exporters in Mexico are this year sending their product to Europe rather than pay the heavy freight charges by rail to the United States.

Litigation over the franchise of the Brooklyn water supply involves rights and plant estimated as high as \$2,000,000.

The clothing manufacturing firm of Ginsheimer, Levinson & Co. of this city, have begun a test case in the Supreme Court against the United Clothing Cutters of America for an injunction restraining a boycott. The allegations are that the United Garment Workers have entered into an unlawful conspiracy to boycott the plaintiffs, have threatened to destroy their trade and have issued circulars to intimidate former customers.

All the models of American guns thus far tried at Springfield have failed with a single exception, which will be decided after further tests.

Southern newspapers predict low prices for cotton if the planters persist in growing more than the world needs. The advice to give more attention to food products is not heeded.

Senator George of Mississippi, who has been recently inquiring, on the part of the United States Senate Committee on Agriculture into the agricultural depression in the South, gives it as his opinion that the South will never—at least in this generation—have generally the high prices for cotton it once commanded. "Cotton," says Mr. George, "will never, but in exceptional cases, and for short periods, be high enough to warrant the producer to rely upon it as a means of purchasing supplies which can be raised at home." The only safe course open to the Southern cotton growers in the future would seem to be a wider diversification of crops, and the curtailment of cotton production to an extent that will remove the danger of a further glut in the market.

The Bridge Construction Company, formed in Trenton, N. J., have for their object the construction of the two great bridges across the East River, already sanctioned by the local authorities and the Department at Washington. The incorporators are Anthony Barrett of Brooklyn, John Fox, Edward Lauterbach and Simon Uhlman of New York; Ernest C. Kieb of Fanwood, N. J., and James Langan of Brooklyn.

The irrigation promoters who are constructing the South Gila canal in Yuma County, Arizona, will put \$2,000,000 in that enterprise. They are likewise operating in New Mexico and California.

The new garbage crematory just put in operation in Philadelphia more than meets every requirement.

The Ottawa Government has authorized an Australian shipping firm to operate a monthly steamship service between Vancouver and Sydney, New South Wales, calling at the Hawaiian Islands. Parliament grants \$100,000 per annum.

There were shipped to China last year by the Canadian Pacific Railway 6,000,000 pounds of manufactured cotton, which is a decrease of over one-third compared with the year 1890, before the exclusion laws were enacted.

The new rice crop now in sight is enormous, approaching 10,000,000 bushels.

It is supposed in Washington that the large expenditures necessary in the Department of Public Works and in river and harbor improvements will be deferred so far as practicable until the condition of the Treasury is improved.

The damage done by the late floods in Queensland, Australia, is estimated at nearly \$25,000,000. Brisbane, the capital of the colony, was the chief sufferer. It is said that the bulk of these losses are those against which no provision could be made, and will fall heavily on those least able to bear them. The effect upon the mercantile and industrial community threatens to be extremely disastrous, the temporary dislocation of trade, according to Australian advices, being a comparatively insignificant matter beside the enormous pecuniary losses involved in total destruction of goods and property, and the absolute ruin which has overwhelmed hundreds of traders and families.

The Massachusetts Legislature rejected a bill to regulate the use of barbed wire fences, after a spirited debate.

The cholera in Europe daily becomes more malignant and threatening.

A new suspension bridge to be erected at Niagara Falls will be a single span of 600 feet and include a double track for the Grand Trunk Railway.

Not a single sailing vessel was employed in the grain trade of New York last year.

A treaty with the Government of Ecuador has been concluded by which the United States is given the right to acquire a coaling station in the Gallapagos Isles, a position of vantage in the Pacific Ocean, but has not been ratified.

A company with \$5,000,000 capital has been incorporated at St. Paul to build a ship canal between that city and Duluth. A primary object is to promote the coal trade.

President Hill of the Great Northern Railway is said to contemplate running a line of steamships from Puget Sound to China and Japan.

The revolutionists in Honduras are said to be on top.

Halifax is at loggerheads with the Dominion Government on the question of admitting emigrants to land without fumigation at quarantine.

The port of Acre on the Mediterranean, the only good harbor between Alexandria and Beyroot, has been connected with Damascus by an English company and promises to become commercially important.

The English steamship companies complain that so few passengers are booked in Europe for the World's Fair, while travel from America is less than usual.

It appears from an official report that the cost of the World's Fair buildings at Chicago has been \$16,708,826, or twice the sum expended for the same purpose at Paris in 1889.

The Iron Age

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Acid versus Open-Hearth Steel.

A considerable number of our prominent engineers and railroad officials are still prejudiced against Bessemer steel, in favor of open-hearth metal, and assume an attitude of hostility to basic material. With us the contest is raging chiefly between the makers of the two grades of acid steel, while in Germany the struggle has been conducted over the question whether basic Bessemer is as reliable a material for structural purposes as is basic open-hearth. Since the German manufacturers are the acknowledged pioneers in the utilization of high-phosphorus raw material, American producers, present and prospective, can learn a good deal from the experience of their transatlantic leaders.

The question of the relative merits of basic Bessemer and basic open-hearth as the steel for structural material has been tested on a large scale with characteristically German thoroughness. Both materials were supplied for the Fordon bridge over the Vistula, the aggregate quantity supplied for the structure being 10,000 tons. The results of the tests have been placed before the public by Herr Mehrrens in a recent issue of *Stahl und Eisen*.

The record is certainly one of which the makers of basic Bessemer steel may be justly proud. Out of 700 charges not a single one was rejected. On 680 charges of structural steel the physical tests showed results which are summarized in the following tables. In them the percentage of the total number of charges which came within the limits enumerated are given. The first deals with the elastic limit:

Range of Elastic Limit, 680 Charges Basic Bessemer Structural Steel.

Elastic limit. Pounds per square inch.	Charges within range. Per cent. of total number.
35,500 to 37,000.....	3.1
37,000 to 38,400.....	11.9
38,400 to 39,800.....	31.6
39,800 to 41,200.....	27.5
41,200 to 42,700.....	16.0
42,700 to 44,100.....	7.7
44,100 to 45,500.....	1.6
45,500 to 46,400.....	0.6

It will be observed that 87 per cent. of the total number of charges came within the range of the elastic limit of 37,000 to 42,700 pounds.

Twenty charges of rivet steel showed that 35 per cent. of the charges had an elastic limit between 37,000 and 38,400 pounds, 55 per cent. between 38,400 and 39,800 pounds and 10 per cent. between 39,800 and 40,700 pounds.

The tests for tensile strength showed the following record, the table again giving the percentage of the total number of

charges which came within the range stated:

Range of Tensile Strength, 680 Charges Basic Bessemer Structural Steel.

Tensile strength. Pounds per sq. inch.	Charges within range. Per cent. of total number.
55,600 to 56,900.....	18.67
56,900 to 58,300.....	38.67
58,300 to 59,700.....	23.53
59,700 to 61,200.....	15.60
61,200 to 62,300.....	3.53

This is certainly an admirable record and is even surpassed by the 20 charges of rivet steel, of which 90 per cent. lay within the range of 53,900 and 55,500 pounds tensile strength and 10 per cent. within 55,500 and 56,000 pounds.

Range of Elongation, Basic Bessemer Structural Steel.

Elongation. Per cent.	Charges within range. Per cent. of total number.
21 to 22.....	0.15
22 to 23.....	0.74
23 to 24.....	1.76
24 to 25.....	8.53
25 to 26.....	17.35
26 to 27.....	26.76
27 to 28.....	23.68
28 to 29.....	14.41
29 to 30.....	5.44
30 to 31.....	1.03
31 to 32.....	0.15
32 to 32.5.....	

Rivet Steel.	Charges within range. Per cent. of total number.
25.2 to 26.....	20.0
26 to 27.....	15.0
27 to 28.....	25.0
28 to 29.....	25.0
29 to 29.8.....	15.0

It will be noted that in the case of the basic Bessemer structural steel the elongation came within the range of 26 to 30 per cent. in a total of 82.2 per cent. of the whole number of charges.

The chemical analyses show the quality of the material, the percentage of the number of charges being given in the following tables:

Phosphorus.	Per cent. of charges.
Range per cent.	
0.019 to 0.03.....	0.86
0.03 to 0.04.....	5.26
0.04 to 0.05.....	14.00
0.05 to 0.06.....	23.15
0.06 to 0.07.....	27.44
0.07 to 0.08.....	19.73
0.08 to 0.09.....	9.43
0.09 to 0.099.....	0.14

Manganese.	Per cent. of charges.
Range	
0.25 to 0.3.....	2.00
0.3 to 0.4.....	21.86
0.4 to 0.5.....	41.00
0.5 to 0.6.....	28.00
0.6 to 0.7.....	6.29
0.7 to 0.8.....	0.71
0.8 to 0.88.....	0.14

Sulphur.	Per cent. of charges.
Range	
0.017 to 0.02.....	2.78
0.02 to 0.03.....	22.22
0.03 to 0.04.....	34.71
0.04 to 0.05.....	23.60
0.05 to 0.06.....	12.50
0.06 to 0.071.....	4.19

Carbon never rose above 0.10 and silicon never above 0.01, so that chemically the steel was of very good quality and very uniform.

The basic open-hearth steel did not show so good a record. Out of 508 charges 16 were rejected, seven thereof because the material was too hard, five because the tensile strength was not great enough, one because the elongation was too low, two because cinder had been rolled in,

and one because the material showed blow holes.

Grouping the reports of the physical tests and the chemical analyses in the same way as was done in the case of the basic Bessemer we have the following tables:

Elastic Limit, Basic Open-Hearth Steel. Structural Steel, 489 Charges.

Range. Pounds per sq. inch.	Charges within range. Per cent. of total charges.
34,400 to 35,500.....	4.2
35,500 to 37,000.....	8.1
37,000 to 38,400.....	15.6
38,400 to 39,800.....	20.3
39,800 to 41,200.....	17.4
41,200 to 42,700.....	12.8
42,700 to 44,100.....	11.4
44,100 to 45,500.....	4.8
45,500 to 46,900.....	2.3
46,900 to 47,600.....	1.2
48,400.....	0.2
Missing.....	1.7

Rivet Steel, 19 Charges.	Charges within range. Per cent. of total charges.
33,600 to 34,100.....	5.3
34,100 to 35,500.....	10.5
35,500 to 37,000.....	5.3
37,000 to 38,400.....	31.6
38,400 to 39,800.....	31.0
39,800 to 41,200.....	31.0
41,200 to 43,700.....	5.3

While in the case of basic Bessemer structural steel 87 per cent. came within the range of 37,000 to 42,700 pounds elastic limit, the percentage of open-hearth steel was 76.1 per cent.

Tensile Strength, Basic Open-Hearth Steel. Structural Steel, 489 Charges.

Range. Pounds per sq. inch.	Charges within range. Per cent. of total charges.
55,800 to 56,900.....	8.0
56,900 to 58,300.....	26.4
58,300 to 59,700.....	25.4
59,700 to 61,200.....	19.6
61,200 to 62,600.....	11.2
62,600 to 64,000.....	9.0
65,100*.....	0.04

Rivet Steel, 19 Charges.	Charges within range. Per cent. of total charges.
51,800.....	5.3
51,900 to 53,300.....	26.3
53,300 to 54,900.....	21.0
54,900 to 56,300.....	21.0
56,300 to 56,900.....	26.4

* Corrugated sheets.

Here again the open-hearth metal displays a lesser uniformity. The table of ductility given below also displays a wider range:

Range of Elongation, Basic Open-Hearth Steel.

Range. Per cent.	Charges within range. Per cent. of total.
19.8*.....	0.2
20 to 21.....	1.0
21 to 22.....	2.2
22 to 23.....	4.1
23 to 24.....	5.6
24 to 25.....	8.6
25 to 26.....	7.7
26 to 27.....	10.0
27 to 28.....	11.0
28 to 29.....	12.0
29 to 30.....	13.3
30 to 31.....	10.6
31 to 32.....	5.4
32 to 33.....	4.2
33 to 34.....	2.0
34 to 35.....	1.5
36 to 36.5.....	0.4
37.1.....	0.2

Rivet Steel, 19 Charges.	Charges within range. Per cent. of total.
25 to 26.....	5.3
26 to 27.....	42.1
27 to 28.....	21.0
28 to 29.....	5.3
29 to 30.....	15.8
30 to 30.8.....	10.5

* Corrugated sheets.

Chemically, the open-hearth steel showed the following, the phosphorus and carbon determinations being made for the

whole 508 charges, while manganese was determined for 84 charges and sulphur for 67 charges:

Phosphorus, Basic Open-Hearth Steel.

Range	Charges within range. Per cent. of total charges.
0.03 to 0.04.....	28.6
0.04 to 0.05.....	27.6
0.05 to 0.06.....	40.1
0.06 to 0.07.....	3.5
0.08.....	0.2

Carbon.

0.09 to 0.10.....	0.6
0.10 to 0.11.....	28.0
0.11 to 0.12.....	25.4
0.12 to 0.13.....	30.7
0.13 to 0.14.....	15.3

Manganese.

0.34.....	1.2
0.35 to 0.40.....	16.7
0.40 to 0.45.....	46.4
0.45 to 0.50.....	33.3
0.53.....	1.2
0.66.....	1.2

Sulphur.

0.04 to 0.05.....	37.3
0.05 to 0.06.....	28.4
0.06 to 0.07.....	22.4
0.07 to 0.08.....	8.9
0.11.....	1.5
0.12.....	1.5

While the basic Bessemer was all below 0.10 carbon, nearly all the basic open-hearth steel was between 0.10 and 0.14 carbon. The sulphur, too, was higher, while the phosphorus was lower.

On the whole, this elaborate series of experiments shows that there is absolutely no ground for prejudice against well made basic Bessemer steel, and that at least in the case of leading German works even more uniform quality of metal is produced by the pneumatic process.

Can Tin Plate Be Too Good?

The charge is now made that American tin plate is too good. But a short time since the objectors to the American tin-plate industry asserted that tin plate could not be made here, that there was something peculiar about it which had enabled the Welsh to monopolize the trade, and that they would always retain control of it. When a few works were started on this side of the Atlantic their product was very critically inspected and the tin plate pronounced fairly good, but much inferior to imported tin plate. Roofing plates first began to earn some commendation for themselves, but the question was then asked, How about bright plates? For a time it really looked as though bright plates were too hard for any but a very few firms to attempt to make. Now, however, American bright plates are becoming quite well known in the trade, and the profound criticism is heard that they are too good. It is stated by experts who represent foreign manufacturers that the American bright plates turned out by our best-known makers are too carefully made, being especially too thickly coated with tin. The change thus wrought in the tone of the criticisms is too marked to be allowed to pass without comment. The American tin-plate industry has won the first great point of advantage in the fight for American markets.

It is curious that this point has been overlooked by our foreign competitors. They seemed to take the matter for granted that cheapness was the sole end and aim. They believed that the price

per box governed everything. They evidently had the impression that American consumers would buy the merest semblance to tin plate if it were offered at an extremely low price. Setting to work to achieve this result, they rolled their sheets thinner to make their boxes weigh less; accomplishing a double purpose in this respect, as they then paid less duty at our ports of entrance. With marvelous skill in shaving items of cost, they succeeded in reducing the cost of tin on bright plates even when it was thought by able and most expert tin-plate makers that the limit in this respect had been reached years since. Confident that raw American practice could not approach such scientific skimping, they, metaphorically speaking, rubbed their hands and cried, "Aha," pointed to their 90-pound boxes with a trace of tin on the steel and defied all America to produce their equal.

It will be some time before Americans who have any regard for their reputations will attempt such a feat. This was evidently the brilliant method for holding trade which some of the British journals had in view after the McKinley bill was passed, when they declared that the increased duties would be nullified by the further cheapening of the cost of producing tin plates.

There is no country in the world in which a consumer is so willing to pay a fair price for a good article as in the United States. Buyers are shrewd, and if possible they would be glad to get more than the worth of their money. But cases are very rare indeed in which a manufacturer deliberately purchases inferior material. Consumers of tin plate have for years been finding increasing fault with the tin plate shipped them from abroad, and have vainly asked for a reform in makers' methods, threatening to engage in the business themselves if this were not done. Better and not worse tin plate has been the demand of the American trade generally. It is now to be had, and in increasing quantity every month, and those who say that American tin plate is too good do not understand the temper of the people. We have been informed by a very large manufacturer of tinware that the goods which he is now making up from American stock will last ten times as long as those made from imported plate of what professes to be the same character. His testimony is without prejudice, as he is not interested in the manufacture of tin plate, but buys in the open market to the best advantage. The comparison so strongly made in favor of American tin plate may be an overstatement; but that is the best evidence of the high standing in the trade which American bright plates have won for themselves.

A little "nerve" is often of great value to a salesman and consequently to the house which he represents. In some staple goods on which prices have long been soft salesmen have recently scored material advances by asking better rates and sticking to them with the determination to get some profit for their employers on the business turned in. It is too frequently the case that salesmen hasten demoralization by advising their princi-

pals that others are cutting prices when the trouble is either imaginary or confined to a few small concerns who would soon have such business as they need and then withdraw from competition. A salesman's function is, of course, to sell. If he cannot make sales he may soon find himself unattached. He is, therefore, measurably excusable for forcing the market at times so that he can get business. But that man is a prince among salesmen who is keen to perceive when he can obtain better prices.

Preserving the Forests.

A generation of men has risen which clamors for the preservation of our forests, lest the land be wantonly despoiled of its chief adornments, its mountains denuded, its streams dried up, its reservoirs exhausted, and a powerful agency for equalizing the temperature throughout the year cease in a measure to exert its benign influence. Moreover, many of the most charming mountain retreats, like those of New Hampshire or the Adirondack region in New York, are liable to be perpetually marred, if not obliterated, unless an authoritative arm is extended to arrest the process of spoliation witnessed from year to year. It is therefore gratifying to observe that many State Legislatures, acting as by common impulse, are moving simultaneously to effect the same end.

The prairie States were among the first to advocate arboriculture. Their province was not so much to preserve as to restore and rehabilitate. Prairie fires, perhaps more than any other agency, had reduced a vast expanse of territory to a desolation, possible of reclamation only as the result of artificial irrigation and a systematic restoration of forest trees. Thence arose a conviction of the necessity for the appointment of forestry commissions, arbor days, &c., until at last the familiar line, "Woodman spare that tree" becomes a positive prohibition rather than a plaintive plea. At the present time formidable syndicates of capitalists are getting possession of all the most valuable timber lands in the country, from Maine and Michigan to the everglades of Florida, and making incursions into the most secluded regions of Canada, in order to feed the capacious maw of the lumber mills being erected at every shipping point accessible either by railroads or navigable waters.

The general Government interposed seasonably to save the magnificent redwood trees (*sequoia gigantea*) of the Yosemite region and Yellowstone Park in Wyoming, but it remained for the several States, each within its own jurisdiction, to supplement the work initiated in the national domain. New Hampshire has taken action in behalf of the White Mountains to hold in check the vandal hands of scheming speculators bent only on private emolument. The State of New Hampshire has asserted its powers of eminent domain in the protection of those who may wish to purchase portions of the existing forest lands at fair prices. The new law in that State, like the present law in Massachusetts, authorizes the State to take and protect the gifts of land

which are made by its own citizens or by the people of other States, and to build roads or paths over these domains, but forbids that they should ever again be used for private purposes. Thus the threatened destruction is arrested. In like manner the Legislature of New York, in passing the Adirondack Park bill, establishes a reservation which insures its protection by placing the entire region in control of a Forest Commission invested with adequate authority. This is a happy consummation of the efforts to save the Adirondacks which have been made in a desultory way for several years. The tract covers at present about 500,000 acres of forest land lying in six contiguous counties, including the islands in Lake George, and provision is made for its future enlargement. Maine is also waking up to preserve the forests in the Androscoggin region, and a bill is now before the Pennsylvania Legislature to stop the denudation of the forest area within that State.

This apparent though independent concert of action is a hopeful augury. And another ground of assurance in regard to forest preservation is found in the declaration of an expert of the Geological Survey, who maintains that the area of forest in the United States is as large as when the country was first discovered, so rapidly do old farms return to woodland where the rural element in population gives way to the advance of manufacturers and commerce.

The Cyclone Season.

The return of spring has brought with it unpleasant conditions not usually associated with the season that budding poets love. The daily papers for the past week have teemed with accounts of the ravages committed by violent wind storms. Cyclonic disturbances have prevailed over a very large portion of the country. The North has suffered as severely as the South, and residents of highlands have fared no better than the dwellers of the plains. Whole communities have been suddenly overwhelmed with destruction by the fury of the winds, and many lives have been lost. The damage to property has been very heavy, although there is no means of forming even an approximate estimate of the aggregate losses sustained throughout the country during the recent stormy period. A winter of great severity and long duration, bearing with much hardship on many business interests, has thus been followed by something even worse. Meteorological experts explain the phenomena of the destructive winds in easy fashion, but allege that their prevalence over such a broad expanse of country almost simultaneously is a new feature of such disturbances. Cyclones and tornadoes are no longer to be classed as belonging to the tropics, but are now recognized as part of the natural phenomena of the temperate zone. Tornado insurance has been carried to a limited extent in localities in which there has been one of these visitations, but it will be very singular if such insurance does not assume large proportions after the occurrences of this spring. The statement has too frequently

been made in print, after a thrilling account of the destruction wrought by a cyclone, that none of the sufferers carried any tornado insurance. The lesson has been taught and the practical application will be made.

Some Americans are beginning to talk as though the heavy decline in prices in the past two years in nearly all branches of the iron and steel industry had put us pretty near the level of European values. Some figures lately made on ship plates and ship angles, for delivery in this country, are likely to dispel such ideas very quickly. Ship plates have been offered, cost, insurance and freight, New York, at £5. 10/, or a shade under 1.20 cents per pound, with the chance that 1.15 cents could be done. Angles have been offered at £5, same delivery, equal to 1.10 cents, and a lot of nearly 500 tons of splice bars have been sold at 1.12½ cents, c.i.f., New York, when the American mills are down to the exceptionally low level of 1.50 cents, delivered. Steel beams can be laid down, c.i.f., New York, at 1.10 cents to 1.20 cents, while 1.85 cents, New York, is a very low price for the domestic article. Considering the fact that each additional fraction of a cent reduction in price involves hardship increasing at a tremendous ratio, we are yet far from the low prices of our foreign competitors.

OBITUARY.

MERRITT PECKHAM.

One of the most esteemed citizens and business men of Utica, N. Y., Merritt Peckham, died at his home about 11 o'clock, April 13. The cause was general dissolution. Mr. Peckham was born in Pottstown, Rensselaer County, N. Y., January 20, 1813, and was the son of the late Seth Peckham. He was widely known as "The Plowman of Pittstown" on account of his being engaged in the business of manufacturing plows. When Merritt was a boy his father sent him to Troy, N. Y., where he learned the plow-making trade with Starbuck Brothers, manufacturers of plows, steam engines, &c. He remained at Troy about nine years, and in 1834 went to Utica.

In 1828, John S. Peckham succeeded to the plow factory of his uncle, Seth Peckham, at Utica, and in 1835 his half brother, Merritt, was admitted, the firm being J. S. & M. Peckham, and the partnership continuing until the death of the senior member of the firm on May 3, 1879. The firm began in 1840 the manufacture of stoves, in the rear of the store. The business grew and the manufacture of heaters and furnaces was added. The firm of J. S. & M. Peckham was continued until the death of John S. Peckham in 1879, when S. Townsend Peckham was admitted to partnership, the firm name remaining the same. About a year ago S. Townsend Peckham retired from the firm and went West. Last February the firm was changed to the J. S. & M. Peckham Company, with the deceased as its president.

The deceased, however, retained a controlling interest in the business, and although he had practically retired several years before, he still gave his valuable advice and wise counsel to the company.

Each of the two big cables for Broadway, now in course of delivery from Trenton, is 10,500 feet in length and weighs 40 tons. Two new lines are proposed, one on Lexington avenue.

CORRESPONDENCE.

The Cost of Steel Manufacture at the Head of the Lakes.

To the Editor: In an earlier letter on the subject of the cost of the manufacture of steel at the head of the lakes, one serious error was made. Please find below corrected statement, with additional data as to quantities, &c.:

Cost of Pig Iron.

3,600 pounds ore.....	\$3.70
1,900 pounds coke.....	4.15
1,000 pounds limestone.....	1.00
90 pounds coal.....	.10
Scrap, &c.....	.10
Total materials.....	\$9.05
Supplies and repairs.....	.65
Labor.....	.75
Total cost of 1 ton pig iron....	\$10.45

Cost of Ingots.

2,340 pounds pig iron.....	\$10.45
112 pounds pig iron.....	.5119
112 pounds 30 per cent. spiegeleisen...	1.6912
36 pounds coke.....	.0766
13 pounds limestone.....	.0130
607 pounds coal.....	.6677
16 pounds ingot mold.....	\$.016
1 pound casting stools.....	.01
Total stool and molds.....	\$0.17
Value of old molds and stools..	.07
Net cost of molds and stools \$0.10	.10
Refractories.....	.12
Repairs and supplies to machinery...	.25
Labor.....	.5070
Total.....	\$14.3874
Deduct 44.8 pounds scrap.....	.22
Net cost of 1 ton ingots.....	\$14.1674

Cost of Rails.

2303 pounds ingots.....	\$15.1338
1140 pounds steam coal.....	1.25
74 pounds heating coal.....	.08
Supplies and repairs to plant.....	.75
Labor.....	.7255
Total.....	\$17.9293
100 pounds scrap.....	.5488
Total.....	\$17.3805
General labor.....	.9125
Total.....	\$18.2930
Interest on plant at 6 per cent.....	.60
Total.....	\$18.893
Incidentals, taxes and insurance....	.50
Total cost of 1 ton rails.....	\$19.393
Cost of 1 ton billets.....	17.393

The above figures are based on molten metal direct from the blast furnace, blown in 20-ton converters, cast in four 12-rail ingots, rolled into rails direct in three four-rail length blooms on three high blooming and rail trains, driven by compound engines furnished with steam from Babcock & Wilcox tube boilers.

PRACTICAL.

The locomotive "John Bull" and two passenger cars used on the old Camden & Amboy Railroad in 1836 have been at the shops of the Pennsylvania Railroad Company at Altoona, Pa., undergoing the necessary repairs preparatory to their transportation to Chicago, where they will be exhibited at the fair. The train will be run over the Pennsylvania Railroad by easy stages, in order to afford an opportunity to the public to see what traveling was like 57 years ago.

The Louisville & Nashville Railroad Company have issued new rates on pig iron from Southern furnaces to points in New England, effective April 12. The rates per carload of 17½ tons of 2268 pounds to all points are: From Birmingham District, \$5.90; from Chattanooga, Tenn., \$5.40, and from Sheffield, Florence and Decatur, Ala., and Rockdale and Napier, Tenn., \$5.65.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 18, 1893.

David A. Wells, Commissioner of Revenue under the Chase financial régime and an expert on such matters, is in Washington, and is in frequent conference with the President and Secretary Carlisle.

The chimerical schemes for providing revenues from the customs on the tariff reform idea proposed by inexperienced theorists of the Ellery Anderson and Shearman school having been publicly discarded by the Secretary of the Treasury and the Administration, and the prospective chairman and members of the Ways and Means Committee of the House of Representatives, Fifty-third Congress, these gentlemen have apparently subsided.

The work of David A. Wells, on the contrary, is not only well received, but his assistance has been invited by the President and the Administration. Mr. Wells, in conversation with the correspondent of *The Iron Age*, gave a general view of his ideas on the subject. He said: "In preparing a plan for the raising of revenue the first step should be the classification of the objects of expenditure for which the revenue is to be raised. In the case of the Government the expenses of administration proper alone can be counted as the fixed charges. The pensions and the interest on the public debt are not the legitimate expenses of the working or administrative branches of the Government, which include executive, legislative and judicial.

"The revenues from customs and internal revenue should be devoted to the legitimate expenses of the Government, and pensions and interest should be provided for elsewhere if the revenues from those sources do not hold out.

"The pensions will strike high water mark within the next year at \$180,000,000. Then they will go down rapidly. If the regular revenues reduced to a certain extent by free raw materials do not yield sufficient, borrow money to make up the deficit for pensions. In a very few years that expenditure will not be as much of a burden as it is now," continued Mr. Wells.

"The whisky internal tax, when \$2 a gallon, only yielded about \$40,000,000 a year. At 90 cents a gallon, the tax today, it yields from \$60,000,000 to \$70,000,000, and next year the estimates put it at \$90,000,000. To this add the internal tax and customs on home and imported spirit, malt and vinous liquors and we have fully \$150,000,000 revenue a year."

In speaking of the revision of the tariff Mr. Wells said further: "The free list will be extended by the addition of wool, iron ore, coal and other articles of this character. This, of course, will reduce the revenue from customs, say \$30,000,000 or \$40,000,000. In the case of reducing the rate of duties on certain articles, say about 25 or 30 per cent. on manufactures of iron and steel, woollens and cottons, the revenues instead of being reduced will be most likely to increase, as lower duties will invite increased importations and consumption of foreign manufactures."

"It is a remarkable fact," said Mr. Wells, "that with the supposed prohibitory duty on tin plate the importations and consumption of foreign tin plates have enormously increased and that, too, regardless of the increased manufacture in the United States." The conversation of Mr. Wells, which may be regarded as reflecting the conversations of the President and Secretary Carlisle, points very conclusively to a very close overhauling of the metal schedule. He gives no figures, but they will be materially lower than existing rates.

It can be stated authoritatively that the

programme for revenue revision will be as follows:

Secretary Carlisle will outline the Department views of a tariff bill very much on the line of the Walker tariff. When completed the President will call Congress together, now proposed about the beginning of September. In order to meet the opposition of the Senators who object to an extra session on the ground that they will have nothing to do pending the month or two occupied in preparing the tariff bill by the committee, it is proposed that the House shall organize and the Speaker shall at once announce the committees on Ways and Means and Coinage, Weights and Measures. The bills introduced on tariff and finance shall then be referred to those committees. The two Houses will then take a recess until after the State elections in November. Upon reassembling the bill will be reported and passed in the House with as little delay as possible. In the Senate it will take its course, the Democrats striving to have the measure before the President, approved and in force by Jan. 1, 1894. Unless some extraordinary upheaval of the calculation of the executive and the majority in the House should transpire, the industrial interests will be able to judge what the future will bring forth in tariff matters.

PERSONAL.

Thomas Wallace of Wallace & Sons, brass and copper manufacturers, was the victim of an unfortunate accident recently. A wooden toothpick penetrated his hand, and blood poisoning setting in, surgical operations became necessary, which have endangered his life.

A. R. Whitney of New York has started for the Puget Sound.

English newspapers report that J. S. Jeans has resigned the secretaryship of the Iron and Steel Institute and that Bennett H. Brough will become the secretary. Mr. Brough has done much in recent years to improve the abstracts from foreign publications which form a part of the proceedings of that body.

John T. Anderson, late secretary, treasurer and manager of the Richmond Standard Spike & Iron Company, has accepted the position of general sales agent of the Tredegar Company.

Witherbee, Sherman & Co. of Port Henry, N. Y., announce that Lewis W. Francis has been admitted to partnership.

Walter Soranton, vice-president of the Lackawanna Steel & Iron Company, was thrown from his horse through the breaking of the stirrups and suffered the fracture of one of the bones of his left arm, besides painful contusions.

In the article printed in our issue of last week descriptive of the works of Best, Fox & Co. at Pittsburgh it was stated that the main building of the firm was 72 x 20 feet in size. This was an error, the building referred to being 72 feet in width by 120 feet in length.

Some of the newspapers, in referring to the suspension of the Carrere & Haas Iron Works, gave the assets at \$14,000 and the liabilities at \$90,000. The correct figure for the assets should be \$140,000.

Witherbee, Sherman & Co. of Port Henry have sent out their annual ore circulars. They offer 75,000 tons of selected "Old Bed 21" lump for puddling at \$3.50, subject to a discount of 40 cents per ton for cash, and 100,000 tons furnace ore at \$2.25, subject to a discount of 25 cents per ton for cash.

San Francisco News.

We are well on into the spring and still the weather is lowering and threatening—weather very unusual for California. During the week the rains have been heavy and have extended all over the State. In some places the season is a couple of months late, while in others grain is beginning to head out. The result, on the whole, will be that crops will be late this year. In some places grain has been drowned out, and though there has been much rain there will be only an ordinary crop of cereals, as some counties report prospects at present to be good for only about half a crop. The fruit crop will be good, with the exception of apricots. In Oregon and Washington the outlook for crops is good. There is little doubt that trade on the coast, as a whole, will be better than it was in 1892, although it is very risky prophesying. The trade in agricultural implements has already set in and is likely to be very good. Mowers and reapers are coming forward freely by rail and are likely to be in large demand, quite as large as a year ago. This is also the case with tools needed in the pursuit of horticulture, as there has been a great addition made to the number of trees planted. There has been a good deal of interruption to general business by the rain, and in this respect the sale of building hardware has suffered, as the rains have interfered with building operations to some extent. Hard times have interfered more, and there has been for some time a decided falling off in the demand for builders' hardware. If, however, crops should come up to expectation and prices should be good, there will be a decided improvement in this respect and a revival in all branches of the metal and hardware trade, a consummation which many a jobber believes is one devoutly to be wished.

We have had large additions to our stocks of hardware, iron and steel by sea of late, the "Frederick Billings" during the week bringing a large quantity and a great variety especially of hardware. The competition between the two lines of clippers and steamers is so keen that we may expect unusually large arrivals by sea for a long time to come. Freight rates have been reduced to a minimum, not only from New York to this city but to Mexico and Central America and a very great deal of merchandise, especially of hardware, will take the sea route. This competition opens wide the doors of trade to many places to which San Francisco has long been a stranger.

The nail market continues in a depressed state and in fact it has been in a condition the reverse of healthy for a long time past. I refer now more especially to California nails. As to Eastern, it must be assumed that those who ship them here or purchase them for this market know their business. The basic price of iron nails is at present \$2 per keg for lots of over 200 kegs.

Tin and tin plate have not taken on a change for the better. The former, which has been for some time advancing slowly, is now quotable at 22½¢ to 22¾¢. Tin plate is in good demand at \$6.10 for coke tin, an advance, and this is quite a change from the inactive condition of the market in these articles but recently. There will be a great demand this year, especially for tin plate. Fruits and vegetables will be canned as largely as in 1892. There will therefore be as much tin plate wanted this year as in 1892 and it is the consciousness of this that has put up the market recently, despite the fact that prospects were that the Democratic Congress and President would cut down if they did not altogether remove the duty from this article.

The Brass Consolidation.—Work is progressing on the consolidation of the brass and copper rolling mill and manufacturing interests of the Naugatuck Valley. The appraisal of the plants has been nearly completed, but it will take at least a month before the basis for a general agreement can be arrived at. The conditions affecting the industry are peculiarly favorable to a union of interests. The stock ownership of the different plants is largely identical. The same parties are often holders of shares in a number of rival concerns, so that the sharp competition among them is particularly hurtful to this class, which is very influential. To what lengths this competition has gone may be judged from the fact that some time since a contract for 200,000 pounds of trolley wire for Brooklyn was taken at 12½ cents per pound at a time when ingot copper was selling at 13 cents. While this is of course an extensive case, it does not illustrate how competition has cut into the business. The Waterbury brass and copper interests justly boast of having an exceptional record in the harmonious relations between the manufacturers and the workmen, but the former will soon be placed in the position of choosing between the alternatives of a sharp reduction in wages, with a possible conflict, or a consolidation which will put prices on a better level.

One of the peculiarities of the Naugatuck Valley concerns, like Benedict, Burnham & Co., the Waterbury Brass Company, Holmes, Booth & Haydens, Plume & Atwood and the Coe Brass Mfg. Company are capitalized far below the actual investment, the stock issues ranging from \$325,000 to \$400,000 in a number of cases. In prosperous times the different corporations extended and remodeled their works out of surplus earnings until the actual valuation of the plants ranges from \$1,200,000 to \$1,800,000. The death, during the past few months, of some of the most prominent men connected with the industry at one time raised some doubts as to whether the undertaking would be proceeded with. It looks now as though it would not be an obstacle. Everything of course depends upon how the report of the appraisers will be received. Even if it does not meet with general approval, it may readily serve as the basis of negotiation which may lead to a final adjustment.

The dry-dock built at the Mare Island Navy Yard, on the San Pablo Bay, in 1842, by the Government, at a cost of \$1,500,000, has recently been sold to a local firm of junk dealers for \$5500.

A movement is in progress to commemorate in a fitting manner the two hundred and fiftieth anniversary of the establishment of the Saugus Iron Works, in 1643, at Saugus, near Lynn, Mass. The foundry was the first erected in America, and much that is historical and romantic is connected with the early settlement and development of this pioneer industry.

Another elevated railway is projected in England. The line is to be at Cardiff in connection with the Bute Docks.

The London General Omnibus Company have recently fitted electric lamps to 140 of their omnibuses. The battery is placed under one of the seats and a lamp of special design is suspended in the center of the roof, giving a most satisfactory light. The installation is said to have been very successful. The ticket inspectors of the company also use an electric light, consisting of a pocket accumulator and a button-hole lamp. This system has been in use for a year and is said to give complete satisfaction.

MANUFACTURING.

Iron and Steel.

In our issue of last week we made mention of the fact that the Shenango Valley Steel Company of New Castle, Pa., had purchased the Neshannock Furnace of the Crawford Iron & Steel Company at that place. We are now advised that the first-named concern are negotiating for the purchase of the blast furnace of the Raney & Berger Iron Company, also of New Castle, and will probably secure possession of the plant within a few days. The securing of these two furnaces will give the Shenango Valley Steel Company a capacity for producing about 120,000 tons of pig iron per year. Much of this product will be used by the concern in the manufacture of Bessemer billets.

The Ohio Steel Company, now erecting a Bessemer plant at Youngstown, Ohio, are having some trouble over the construction of the plant, and a number of important changes have been made in the plans. One of the contractors has been relieved and a portion of the work directed under his supervision has been torn down and will be rebuilt.

The Falcon Iron & Nail Company of Niles, Ohio, manufacturers of sheet iron and steel, and which concern have just about completed the erection of a large plant for the manufacture of tin andterne plate, have applied for a charter of incorporation under name of the Falcon Tin Plate & Sheet Iron Company, with a capital of \$300,000.

During March the product of the Etna Iron & Steel Company of Bridgeport, Ohio, amounted to about 4900 tons. When it is considered that this product consists of finished material only, such as bars, sheets, angles, tees, &c., it will at once be seen that the output is a very large one.

The Millholland Tube Company of Reading, Pa., have been granted a charter of incorporation with a capital of \$20,000. The directors are Henry Millholland, Richard T. Leaf, Morton L. McIlvaine, Brayton McKnight and J. Heister McKnight.

One of the blast furnaces of Shoenberger, Speer & Co., at Pittsburgh, has been blown out for relining and repairs. At the Juniata Iron & Steel Works of Shoenberger & Co., two vertical water tube boilers of "Caball" design are being added, built by the Aultman-Taylor Machinery Company of Mansfield, Ohio.

Work on the new Bessemer plant now being built by the National Tube Works Company at McKeesport, Pa., is being pushed rapidly, and it is the expectation of the concern to commence the manufacture of Bessemer steel about September 1 next. The new plant will have a capacity of about 800 tons per day, and is being erected by the Pittsburgh Iron & Steel Engineering Company of Pittsburgh.

The fifth "ordinary general meeting" of the Otis Steel Company, Cleveland, was held in London, England. The available net profits, including balance brought forward, were £49,381, compared with £30,873 in 1891, which included £1974 from the previous year. The full amount of debenture interest, viz., £18,000, has been paid, and the dividend on the preference shares to June 30 last, £24,000, distributed. Of the latter item, £12,000 had accrued, but was not paid in the previous year.

The Berlin Iron Bridge Company of East Berlin, Conn., have received the contract for the new rolling mill building from the New Haven Rolling Mill Company, at New Haven, Conn.

The Apollo Iron & Steel Company of Pittsburgh, with works at Apollo, Pa., manufacturers of galvanized iron andterne plates, have recently purchased considerable property in Apollo, which will be used for the extension of their present plant. Just what the nature of these improvements will be have not as yet been determined by the firm. We are advised that the report that a Bessemer plant would be erected on the property is without foundation.

Rebecca Furnace of the Kittanning Iron Company, Limited, at Kittanning, Pa., which has been idle for more than a year, was put in operation on Monday, the 10th inst. During the shut down extensive repairs were made to the plant. The furnace will be operated on forge iron, which will be used by the firm in the manufacture of muck bar.

The Solid Steel Company of Alliance, Ohio, have recently made some changes in their buildings, rearranging the form of doing their work, but these alterations did not involve the opening of any new departments.

The Colorado Fuel & Iron Company of Pueblo, Col., have recently added two Whiting cupolas to their plant. These furnaces have a

combined capacity of 25 tons per hour, and were constructed by the Detroit Foundry Equipment Company, Detroit, Mich.

The demand for open hearth steel castings produced by the Haugh-Kurtz Steel Company, Indianapolis, Ind., has been one of phenomenal growth from the inception of the present plant, which is operating to its fullest capacity.

The Whiteley Land Company of Muncie, Ind., have disposed of their interests to a Pittsburgh syndicate, headed by Thomas Liggett. The deal also involves the purchasing of 140 acres of land lying contiguous to the city, the purchase price being \$125,000. On the land will be located a malleable iron works that will give employment to 500 hands, which will be operated by Messrs. Burt and Elmer Whiteley of Springfield, Ohio, who are also interested in the Whiteley Malleable Iron Works. These gentlemen will retain their interests in the Springfield plant, the building of the branch works at Muncie, Ind., being for the purpose of supplying their Western customers.

It is stated on good authority that the Hercules Pipe Works of Pell City, Ala., will remove their plant to Anniston, a deal having been closed last week. The product of the plant is sanitary pipe. Work will be commenced at once on the new buildings. The capacity of the plant is to be doubled after the removal.

It is stated that the Alabama Steel Works, a reorganization of the old Fort Payne, Ala., company, will at once commence the operation of the basic steel plant which was erected at that place two years ago, but has never been operated.

The wire nail department of the Oliver & Roberts Wire Company of Pittsburgh, Pa., has been doing some exceptionally good work recently. The company use the nail machine made by M. M. Smith of Greenpoint, Brooklyn, and on March 29, 30 and 31, 134 of these machines made 2214, 2266 and 2300 kegs, respectively, or an average production for each machine per day of 22¼ hours of 18½ kegs. The sizes were not changed during the three days, and were as follows: 11 machines on 3d fine, wire No. 15½; 8 machines on 3d common, wire No. 14; 17 machines on 4d common, wire No. 13; 6 machines on 5d common, wire No. 12½; 19 machines on 6d common, wire No. 12; 3 machines on 7d common, wire No. 11½; 22 machines on 8d common, wire No. 10½; 16 machines on 10d common, wire No. 9½; 2 machines on 16d common, wire No. 8; 7 machines on 20d common, wire No. 6; 1 machine on 60d common, wire No. 2; 2 machines on 6d finishing, wire No. 14; 4 machines on 2d finishing, wire No. 17; 2 machines on 4d finishing, wire No. 16; 4 machines on 8d box, wire No. 13. It will be observed that the nails were neither large nor small, but of average sizes.

L. S. Colyar, president of the Rome Iron Company, whose furnace is located at Rome, Ga., advises us that they are contemplating the building of another furnace at Rome, a duplicate of the present stack, but the question has not yet been fully settled.

According to the Wellston (Ohio) *Sentinel* the Wellston Furnace Company, owners of the Etna Furnace, have placed the plant in the hands of a company called the Ironton Coal & Iron Company, who have executed a mortgage for \$140,000 with which to make repairs and put the furnace in blast.

The Shelby Steel Tube Company of Shelby, Ohio, have increased their capital stock from \$200,000 to \$500,000.

According to St. Louis, Mo., newspapers, the Brazelle Steel & Iron Company, recently organized at that city, have purchased 20 acres of land upon which they will erect a plant of a daily capacity of 100 tons. The company own a new process for which extraordinary claims are made.

The Rockbridge furnace of the Virginia Iron & Railway Company, at Goshen Bridge, Va., which has been undergoing repairs for several months, will shortly go into blast.

Eighty men employed in the Pacific Rolling Mills, San Francisco, struck against a 10 per cent. reduction in wages.

The Columbia Iron Company at Columbia, Pa., will erect an addition 100 x 160 feet to their present plant.

The Lehigh Iron Company, Allentown, Pa., which failed some time since, has been reorganized, a limited partnership having been formed to run for 20 years. The capital stock is \$63,000, and the officers William H. Ainey, president and treasurer, and Frank J. Remmel, secretary, who also constitute the managers, together with Martin Kemmer, David Kuntz and John R. Gossler.

The Muncie Iron & Steel Company, Muncie, Ind., are rapidly progressing with the erection of their mill and expect to begin operations about May 1. They will make rods, bands and hoop iron, and bar iron up to 3 inches.

They will also make a specialty of steel shapes. Their mill is conveniently located, having access to all the natural gas required, and is also favorably located for shipping and receiving goods.

The Youngstown Foundry & Machine Works are running full and are busy on rolls. The large ones for the Aetna Iron & Steel Company of Bridgeport are finished and will be shipped the first of this week. The foundry is also getting out a pair of large muck rolls for the upper mill of the Union Iron & Steel Company.

There is every indication that a new steel mill will be erected in Sharon, Pa., within a short time. A number of conferences there participated in by capitalists has resulted in a plan being mapped out. The project is yet undeveloped, but there is a strong possibility that it will soon take definite shape.

The bar mill at the Cherry Valley Iron Works is idle this week caused by the repairing of the furnaces. They are also making the mill a three-high roll finishing mill. The company are preparing to make numerous improvements the coming summer.

The Carbon Steel Company of Pittsburgh, manufacturers of open-hearth steel, whose plant was illustrated and described in *The Iron Age* of March 9, have recently awarded a contract to the Pittsburgh Iron & Steel Engineering Company of that city for the erection of some large additions to their plant, which will very materially increase their capacity. Among other additions the contract calls for the erection of two 30-ton open-hearth furnaces, which when completed will give this firm an equipment consisting of six 30-ton and two 15-ton open-hearth furnaces. There will also be erected one electric traveling crane over the loading shed, and one in the soaking pit, giving a total of seven cranes in the plant, three of which are of 5 tons capacity and four of 10 tons capacity. The boiler capacity will be increased by the erection of eight boilers 54 inches in diameter and 30 feet long, making a total of 24 boilers of the above capacity. Other minor additions to the equipment will also be made, and several building will be materially enlarged in order to accommodate the new machinery. When completed the Carbon Steel Company expect to turn out 350 tons of open-hearth steel every 24 hours, their present capacity for that period being about 225 tons. A large shear, a duplicate of the present one in the large blooming mill will also be erected and will be built by the Morgan Engineering Company of Alliance, Ohio. This firm shipped last month over 4000 tons of finished open-hearth plates, and the shipments would have been much larger but for the fact that the large blooming mill was on single turn. This mill is now running double turn, and it is expected that shipments for April will be even larger than for March.

Machinery.

The Pittsburgh Gauge Company, with offices at 110 Market street, Pittsburgh, manufacturers of steam specialties, are having an active demand for their High and Low Water Column Alarms and are operating their works night and day, and shipping their goods about as fast as made.

The Pittsburgh Locomotive Works of Allegheny, Pa. have received an order from the Kansas City, Fort Scott & Memphis Railroad for 16 locomotives. These will be equipped with oil cups of a new design, being the invention of E. D. Bangs of Milwaukee, Wis.

The Caldwell Boiler Company, 15 Cortlandt street, New York, have been awarded the contract to install 455 horse-power of boilers in the New York building, corner of Broadway and Dey street.

T. B. Luzier & Co., Philadelphia, are completing an order for three 24-foot fly wheels for the Philadelphia Engineering Works. The wheels are made in segments, ten to each wheel, 15 inches thick at rim and 22 inches wide under face. The weight of each wheel complete is 50 tons.

The Mahoning Rolling Mill Company of Danville, Pa., report business brisk at their Enterprise and Mahoning Foundry & Machine Works. They have just completed a large roll train for the Phoenix Iron Horse Shoe Company of Joliet, Ill., and are engaged in the construction of a rotary squeezer, weighing about 80,000 pounds, and an improved ore-grinding pan for the same concern. They have also furnished and put in a horizontal tubular boiler for the State Hospital for the Insane, Danville. Among the contracts now approaching completion at their works may be mentioned those for machines for drying and roasting phosphate for the Fort Meade Phosphate Company of Fort Meade, Fla., and for the Arcadia Phosphate Company of Arcadia, Fla.; the reconstruction of the blast furnace of the Montgomery Iron Company of Port Kennedy, under the plans by Frank C. Roberts & Co. of Phila-

delphia, and for the iron work for the new store building of Jonas Long & Sons, at Wilkesbarre, Pa.

Some extensive improvements are being made at the works of the Oil Well Supply Company, located at Twentieth and Smallman streets, Pittsburgh. The pipe-cutting shop will be extended to double its capacity. Pipe is made in this shop from sketch work for electric light companies. The machines for fitting it up are so perfect that a line of pipe can be put together that will not vary $\frac{1}{4}$ inch from the sketch in a distance of 2000 feet. The blacksmith and machine shops will also be enlarged as far as the extent of the company's premises will permit. Stationary boilers will be removed, and the latest pattern of domeless boilers will replace them. The company intend to manufacture domeless boilers for all drilling purposes.

The Angelica, N. Y., machine shops, which have not been in operation for more than five years past, are to be opened again.

The old cupola of the Wheeler furnace plant on Columbia street, Utica, N. Y., is being torn down preparatory to the building of a new and improved one. An addition to the molding room, 50 x 60 feet in size, is also to be erected.

The Friction Pulley & Machine Company of Sandy Hill, N. Y., have received their new Corliss cupola and have commenced the erection of a new engine house.

The West Virginia & Pittsburgh Railroad will erect repair shops at Weston, W. Va., at a cost of \$40,000.

The Bessemer Iron & Development Company have been chartered at Llano, Texas, by A. C. Schryver, Richard Wooley of San Antonio and others, to develop iron lands, erect furnaces, &c. The new company are capitalized at \$3,000,000.

As has already been explained, the Machinery Hall at Columbian Exposition is divided into three bays, each covered by an electric traveling crane, that in the central bay being built by the Yale & Towne Mfg. Company. This crane has been in active and constant operation since the middle of December, 1892, placing the exhibits and handling the heavy materials, both day and night. Not only has it been used upon the work for which it was erected and intended, but has been compelled to assist in the placing of the exhibits for the bays covered by the other cranes, pending the starting of those cranes.

A new company has purchased the Fort Payne, Ala., machine shop and are now considering the advisability of moving it to some other point. It was sold last week to secure a mortgage loan of \$15,000, and purchased by a representative of the creditors for \$14,350. Some flattering offers have been made the new owners to move to other points.

Last week the fillers at the Chattanooga, Tenn., Furnace Company's plant made a demand for an advance of 10 cents per day in wages, which was refused, and the men went out on a strike. They were receiving \$1.50 per day. Their places were filled without any difficulty, but some of the other employees are now threatening to join the strikers. It is now believed that the trouble will interfere with the operation of the plant.

The Shultz Belting Company, St. Louis, are sending to the trade a photograph neatly framed showing three rolls of belting recently shipped by them. They include an 80-inch belt for the Toledo Electric Light & Street Railway Company, Toledo, Ohio, which, by the way, is the widest belt known in the world, a 72-inch belt for the St. Louis and Suburban Railway Company, St. Louis, Mo., and a 60-inch belt for the Omaha & Grant Smelting Works.

Fire attacked the plant of L. M. Rumsey Mfg. Company, St. Louis, Mo., on the morning of the 14th inst. The damage was quite heavy, which, however, was fully covered by insurance. The company are out with an announcement to the trade in which they state all orders intrusted to their care will have their usual prompt attention.

The American Engine Company at Bound Brook, N. J. have been reorganized to manufacture all kinds of engines. The company formerly built high-speed engines that did not meet with ready sale, which led to a suspension of operations.

It is said that the Watts-Campbell Company of Newark, N. J., are about to make extensive additions to their plant in order to meet their growing business. The addition will be 58 x 90 feet, the iron frame work being furnished by the Berlin Iron Bridge Company of East Berlin, Conn., and will be used as a foundry. It will be equipped with a 30-ton electric traveling crane. A cupola building 25 x 40 feet will also be erected, and new machines added to various departments of the works.

The Pond Machine Tool Company of Plainfield, N. J., are adding to their plant a new structure 67 x 30 feet in size.

The foundry facing factory of G. W. Anthony & Co. of Allentown, Pa., has been burned, at a loss of \$8000. The building and machinery were new, the plant having been built last fall.

The Hooven & Rentschler Foundry Company, at East Hamilton, Ohio, have contracted for an addition to their present foundry of a structure 100 x 100.

The Fisher Pipe Foundry, at Allentown, Pa., has been sold by order of the court to John Bowers, plaintiff in equity proceedings, for \$22,000.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh have received a contract from the Minneapolis Rolling Mill Company of Minneapolis, Minn., for the erection of a shear with engine. This shear will have a capacity of cutting up to 4 inch rounds cold, and will contain some new features. The entire plant of the firm is running night and day in all departments and sufficient orders are on hand to keep the works employed in this manner for some time to come.

The Stark Machine & Tool Company, Buffalo, N. Y., report sales in the past week of three tinners' machine outfits, one No. 20 and one No. 30 power presses, 1 complete plant for making $\frac{1}{2}$, 1, 2 gallon varnish cans, including dies, squeezers, floaters, &c. This company found it necessary to purchase two more large lathes, two shapers, and two large drills.

The S. Obermayer Company of Cincinnati, Ohio, have been appointed sales agents of the Blakeney cupola.

Miscellaneous.

The Pittsburgh Steel Hollow Ware Company of Allegheny, Pa., were granted a charter last week with capital stock of \$50,000. The incorporators are Jno. S. McIntosh, Jas. McNaughtner and Daniel McNaughtner.

The Stuart & Peterson Company's new plant at Burlington, N. J., covers ground 410 x 200 feet, and the foundry building is 280 x 67 feet, the main building being three stories. The fire protection is excellent, there being automatic sprinklers on every floor. The enameling ovens are of improved patterns and are capable of the enameling of extra large articles. There are many improved appliances in connection with the plant, mainly the result of extended investigations by a member of the company during a special visit to Europe. The Kearns improved jappanning ovens are used, the only ovens of the kind in this country. The turning lathes turn out the ware automatically, and it is claimed that their set of lathes are, of the kind, the only in existence. There are excellent wharfage facilities at the works, large vessels being enabled to receive and discharge at the company's own wharf. There is a railroad switch opening directly into the plant. Operations were commenced April 1.

The Youngstown Bridge Works have closed contract for large iron car buildings for New Orleans Railway Company.

The Menzel Foundry Company, capitalized at \$50,000, have filed articles of incorporation at Minneapolis, Minn., the object being to conduct a general foundry business.

The Cumberland Mfg. Company of Eddyville, Ky., will remove their plant to Baton Rouge, La., and operate the same with convict labor.

At the works of the Westinghouse Air Brake Company, Wilmerding, Pa., notice has been posted announcing a reduction in wages of from 10 to 50 per cent. The expert machinists are not affected, the reduction applying only to those engaged on piece work.

At a meeting of the Board of Directors of the Allegheny Heating Company, Allegheny, Pa., held last week, the regular quarterly dividend of 2 per cent. was declared, and in addition an extra dividend of 5 per cent., payable to stockholders on record April 20.

Among recently authorized corporations in Illinois are the following: The Hinson Car Coupler and Mfg. Company, Chicago; capital stock, \$2,650,000; incorporators, Joseph E. Forsyth, Erekine R. Merrill and James P. Ennis. The Chicago Wind Motor Company, at Chicago; capital stock, \$30,000; for the manufacture of wind motors, pumps and towers; incorporators, Frank A. Hecht, A. B. Peterson and Albert Raymond. The Shilcock Mfg. Company, at Cragin, Cook County; capital stock, \$25,000; for the manufacture of iron, brass and copper goods for plumbing and for enameling; incorporators, Francis L. Shilcock, Ernest C. Shilcock and Albert M. Woodward. The Taylorville Mfg. Company, at Taylorville; capital stock, \$15,000; to manufacture wind mills, tanks, towers, pumps, &c.; incorporators, H. B. McCaslin, N. Gandy and H. S. Willey. The Sykes Steel Roofing Com-

pany, at Chicago; capital stock, \$50,000; for the manufacture of roofing; incorporators, R. G. Sykes, C. O. Hart and H. G. Murphy.

The Smith-Hill Elevator Company of Quincy, Ill., have secured the contract for 18 freight elevators to be erected in the different World's Fair buildings.

The Mutual Coke Company of Greensburg, Pa., have sold their entire plant to the United Coal & Coke Company for a consideration reported as being \$300,000. The purchase includes all interests of the first-named company, consisting of coal, surface, tipples and sidings.

The Board of Directors of the People's Natural Gas & Pipeage Company of Pittsburgh have declared a quarterly dividend of 2 per cent, payable to stockholders on record April 20.

Negotiations have again been commenced looking to the consolidation of the Southern Malleable Iron Company of Chattanooga, Tenn., and the Hinson Car Coupler Company of Chicago. The directors of both companies now have the matter under advisement, but nothing definite has yet been determined. If the consolidation is made the headquarters of the company will be at Chattanooga and the plant there greatly enlarged.

The Duthie & Dagget Tool Company, Indianapolis, Ind., although comparatively a new concern, have already found it necessary to increase the capacity of their machine shop. Plans for the new shop are now under way and the work of erecting will be commenced at an early date. When completed it will be fitted up with the latest and most modern tools and appliances.

John Gleason of Philadelphia has just completed a spoke lathe and a full set of finishing machinery for Edward Barker of Millport, Chemung County, N. Y., manufacturers of hubs and spokes.

The Hausman Art Metal Company of Niagara Falls, N. Y., have been incorporated. The capital stock is \$150,000 in 1500 shares. The directors are: Lincoln Hausman, George R. Watson, New York; H. G. McConaughy, Philadelphia; Robert H. Waite, Hugh Reavey, New York; Samuel J. Moore, Toronto.

The Atlantic Improvement Company of Long Island City, Long Island, N. Y., have placed the contract for their new power station, consisting of an engine and boiler house and dynamo room, with the Berlin Iron Bridge Company of East Berlin, Conn.

Extensive shops for the Baltimore & Ohio Southwestern Railway have been commenced at Chillicothe, Ohio.

The Reeves Pulley Company of Columbus, Ind., have opened a large branch house, with complete stock, at 58 and 60 South Canal street, Chicago. This branch will be under the directorship of C. L. Rice, formerly of the Rice Machinery Company.

It is rumored that the Burlington & Missouri Railroad Company will make connections at Hartville, Wyo., about 100 miles north of Cheyenne, and extend their line to Cheyenne and Denver. It is believed that the development of the iron fields at Hartville is the prime object of the extension.

The New York Central & Hudson River Railroad shops at Syracuse will be closed at once and operations transferred to the new shops at Depew. About 160 men have already been discharged, and it is expected that the entire force of 460 men will follow in a few days. The old works at Syracuse will be torn down.

The Grant Corundum Wheel Mfg. Company, whose plant at Chester, Mass., was burned recently, will seek a new location for building, probably in the West, where the greater portion of their product is marketed.

It is unofficially reported that the shops of the Pennsylvania Railroad Company, now located at Blairsville, are to be removed to a point near Johnstown.

The removal of the Northwestern Car Company from Detroit, Mich., to Oshkosh, Wis., is now said to be an assured fact. The works are to receive \$25,000 cash and a site of 25 acres of land as a bonus.

The plant of the Covington Brass Company, at Covington, Ky., has been destroyed by fire. Loss, \$75,000; insurance, \$18,000.

The capital stock of the Detroit Sheet Metal & Brass Works, Detroit, Mich., has been increased from \$100,000 to \$150,000.

It is stated that the order issued about a year ago by the Spanish customs authorities demanding that a certificate of origin should accompany all goods entering that country, has resulted in discriminations against goods from the United States.

TRADE REPORT.

Practically the deadlock in the Cleveland Ore trade continues, although, on the whole, the situation seems to have swung back again to a little more favorable position for the buyers.

Bessemer Pig has eased off in Pittsburgh, and our Chicago correspondent telegraphs that in that market there have been some round sales.

Billets have continued to decline, and transactions in Pittsburgh are recorded at \$22.25 for early forward delivery. For longer delivery even lower prices have been agreed to. We hear of a sale of over 13,000 tons of Soft Steel, delivery to extend over six months, to a large Western Pennsylvania Sheet mill at \$23. In Eastern Pennsylvania, too, Western makers have been again underselling and have caused a weakening in prices.

In the Steel Rail trade, the news of the greatest interest is that the Colorado mill has captured the Burlington order for 25,000 tons, and a Santa Fé contract for 10,000 tons, the Chicago mills declining to meet the competition.

In the East, and to a less extent in the West, the appearance of very considerable blocks of Old Steel Rails, fit to relay, is a feature. The trunk lines, forced to put in heavy Rails, are taking out 60-lb Rails, many of which are still in excellent condition. Such Rails are being offered at \$20 per ton.

The old story of dull business comes from all the leading primary markets on Foundry Irons. The statistical position, healthy as it is, does not inspire confidence with buyers, who are taking only moderate quantities. Our Philadelphia correspondent notes the sale of about 10,000 tons of lower grade Iron at a shade above \$12. Some leading Southern producers are pressing No. 2, and prices as low as \$9 at Birmingham have been made to clear away accumulations.

From Western points come reports of quite a good demand, and yet it is from Pittsburgh that the news comes of a cut in Beams and Channels to 1.60¢ per lb, at which they are now offered. It looks as though the policy of forcing the fighting had been entered upon. Gossip in the trade has it that even 1.50¢, Pittsburgh, has no terrors for a modern mill. In the East the volume of work closed continues disappointing.

Specifications for Plates are coming out so slowly that many mills are hunting for quick work, so that under special circumstances orders are taken at very low figures.

In the Pipe trade there has been a moderate advance, and the first large Pipe lines contracts, aggregating about 24 miles, have been placed.

Negotiations are progressing among the Copper producers on both sides of the Atlantic to renew the international agreement, but the usual stumbling block—a claim for a larger share of the total by some of the mines—will have to be removed first. The metal itself is weaker, in spite of export sales and further negotiations pending for the sale of 5000 tons abroad.

Lead is still stiff. Spelter is quiet, although the talk of consolidation is again heard.

Chicago.

(By Telegraph.)

Office of The Iron Age, 50 Dearborn street, CHICAGO, April 19, 1893.

Pig Iron.—The demand is of an irregular character, covering heavy transactions of special qualities, with only light sales in a general way. Among the contracts placed the past week was one for several thousand tons of Bessemer Pig. Local manufacturers are still enjoying the bulk of the business. Their prices are quite firm but unchanged. Representatives of Southern companies are talking a little more cheerfully, having advices that on most grades their companies are now well sold up. Less is heard of concessions on Southern, cuts of 5¢ @ 10¢ securing such orders as are now current. Inquiries are a little better for Lake Superior Charcoal. Consumers talk about purchasing considerable quantities, but it is likely that, as usual, they will discuss the matter for some time before really entering the market. An effort is being made to push Charcoal prices down, and reports are current of weakness in some quarters, which the manufacturers deny, claiming that the small sales now being made are realizing \$16.75 and higher. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal	.....	\$16.50	@	\$17.00
Local Coke Foundry, No. 1	.....	13.75	@	14.25
Local Coke Foundry, No. 2	.....	13.00	@	13.25
Local Coke Foundry, No. 3	.....	12.75	@	13.00
Local Scotch	.....	14.00	@	15.00
Ohio Strong Softeners	.....	16.00	@	16.50
Southern Silvery, No. 1	.....	.....	@	15.00
Southern Silvery, No. 2	.....	.....	@	14.50
Southern Coke, No. 2	.....	13.00	@	13.25
Southern Coke, No. 3	.....	12.80	@	12.75
Southern, No. 1, Soft	.....	13.00	@	13.25
Southern, No. 2, Soft	.....	12.80	@	12.75
Southern Gray Forge	.....	12.25	@	12.35
Tennessee Charcoal, No. 1	.....	16.50	@	17.50
Alabama Car Wheel	.....	.....	@	18.85
Coke Bessemer	.....	14.50	@	15.00
Hocking Valley, No. 1	.....	16.75	@	17.00
Jackson County Silvery	.....	16.75	@	17.00

Bars.—A little better feeling is apparent. Good orders have been taken at 1.52½¢, Chicago, for Common Iron, base sizes. Buyers are obliged to pay more for prompt delivery than for deliveries scattered over three or four months. A great deal of business is in sight. Quotations range from 1.50¢ to 1.55¢, Chicago, according to the character of the specifications. Soft Steel contracts have been placed for considerable quantities at prices above the current rates for season delivery and more orders of the same kind are in the market. The general quotation for Soft Steel Bars rolled from Billets is quite firm at 1.70¢, Chicago. The progress being made by Soft Steel in displacing Iron is shown by the experience of a large manufacturing concern here, whose consumption of Iron the past year was only one-eighth of their requirements, but it will be less the coming year. Quotations on small lots from store are maintained at 1.75¢ @ 1.85¢ on Soft Steel, but while Iron is quoted at 1.70¢ @ 1.80¢, some of the jobbing houses are reported to be cutting this price very materially.

Structural Material.—The business in this line has increased very decidedly the past week. Orders are not only more numerous, but are increasing in tonnage, although no very large contracts have transpired. Prices are unchanged, but less hesitation is manifested by buyers in placing orders at the rates asked by sellers. Quotations on mill orders, Chicago delivery, are as follows: Beams, 1.90¢ @ 2.05¢; Angles and Universal Plates, 1.85¢ @ 1.95¢. Small lots of Beams are selling from stock at 2.05¢ @ 2.15¢.

Plates.—Trade is rather quiet, both from mill and from store. There is now little apprehension of a boiler-makers' strike. Each manufacturer has posted a notice in his shop that after May 1 the shop will be run nine hours and the same

wages paid as were previously paid for ten hours' work. This action is taken by the manufacturers as individuals, and is believed to be satisfactory to the workmen. The manufacturers of Boiler Tubes have advanced quotations as follows: Three inches and larger, 67½% discount; 2 inches to 2½ inches, 65% discount, Chicago delivery. Dealers report that these prices are now likely to be sustained, as the advance is not very great and the condition of the trade in Tubes seems to warrant a little better price. Quotations on mill shipment, Chicago delivery, are as follows: Tank Steel, 1.75¢ @ 1.85¢; Shell Steel, 2.10¢ @ 2.15¢; Flange Steel, 2.25¢ @ 2.30¢; Ordinary Fire Box, 3.05¢. Store prices are as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.20¢ @ 2.40¢; Shell, 2.35¢ @ 2.50¢; Flange Steel, 2.60¢ @ 2.80¢.

Sheets.—The inquiry for Black Sheets has fallen off again, the trade being apparently well supplied. The mills now seem to be full of orders, and prices are maintained at 2.85¢ to 2.90¢, Chicago, for No. 27 Common Iron. Galvanized Sheets are in very good demand, but prices are not so firm. Juniata is generally quoted at 70 and 10% off for Chicago delivery from mill, but further discounts are being made, according to the character of the order. Small lots from stock are selling at 70 and 2½% @ 70 and 5%. Sheet Copper is now being quoted in small lots at 30 and 5% discount.

Merchant Steel.—Inquiries are good, but actual transactions the past week have not been large, so that trade is comparatively inactive. Manufacturers quote unchanged prices, say 2¢ @ 2.10¢, Chicago, for Open Hearth Machinery and Spring Steel, while Bessemer Tire now ranges from 1.70¢ to 1.75¢. Tool Steel is still quoted at 6¢ @ 7¢ for ordinary and 12¢ upward for specials.

Rails and Track Supplies.—Orders are confined to small lots ranging from 1000 to 3000 or 4000 tons. The number of such orders continues to increase and prospects are still good for fair business. Prices here are firmly maintained at \$30 @ \$32, notwithstanding the competition of the Colorado mill for business arising in the far West. Local manufacturers prefer to sustain prices on their regular business rather than demoralize their trade by reducing their figures to the basis necessary to capture orders which are now going to the Colorado. Large contracts have recently been placed for Splice Bars. We continue to quote Iron and Steel Splice Bars 1.65¢ @ 1.70¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.65¢, while Spikes are a little weaker at 1.95¢ @ 2.05¢.

Old Rails and Car Wheels.—Old Iron Rails have sold near here the past week at \$17.50 @ \$17.75, but not for Chicago delivery. Mills here seem to be well supplied for the present. Offerings are being made by some of the railroads of considerable quantities, but they are not disposed to take the prices now ruling. Dealers look for still lower prices in the near future. Old Steel Rails are quiet, but continue to be quoted nominally at \$11.25 @ \$15, according to length. Old Car Wheels have sold the past week at \$14.50 @ 14.75, but seem to be quite scarce and may take a slight turn upward.

Scrap.—Business in Old Material is the subject of a great deal of negotiation and counter offers. Actual prices are difficult to get. It is stated that some of the dealers have been shading \$14 on No. 1 Forge. Consumers here who have been offering \$14.50 have now reduced their offers to \$14; at the same time, some dealers are paying close to \$15 for material to fill old contracts taken at the higher figures. Stove Plates are very scarce and in good

demand for puddling; dealers are offering \$8 for them. Dealers quote as follows per net ton: No. 1 Forge, \$15; No. 1 Mill, \$10.50; Sheet Iron, \$6; Pipes and Flues, \$10; Axles, \$21; Horseshoes, \$15; Fish Plates, \$16.25; Spikes and Bolts, \$14; Cast Borings, \$5.75; Wrought Turnings, \$8; Axle Turnings, \$9.50; Heavy Cast, \$11 @ \$11.25; Stove Plate, \$8.50 @ \$9; Malleable Cast, \$9; Mixed Steel, \$10 @ \$10.50, gross ton; Leaf Steel, \$17.75.

Metals.—A further decline is noted in Copper. Carload lots of Lake are now selling at 11½¢ and Casting Copper 11¢. Spelter has stiffened considerably, and sellers are asking 4.25¢, Chicago, for carloads. The prospect of a strike among coal miners in the vicinity of the smelting works is affecting the views of producers. The Pig Lead market is firm, with an upward tendency. Quite large sales have been made, and consumers generally are inquiring for future Lead. Prices here have ranged from 3.90¢ to 3.95¢. At the close 3.95¢ is bid and 4¢ asked.

A contract was signed last week providing for the removal of the works of the Chicago Steel Company to Chicago Heights. The present works of this company, which were established in 1873, are located on the line of the Chicago & Northwestern Railway at North avenue and Noble street, Chicago. They have two trains of rolls and make a specialty of working up Steel Rail ends into agricultural shapes. The company have recently been reorganized with R. H. Buckingham as president and E. H. Buckingham as general manager. Ebenezer Buckingham, who established the business, is president of the Northwestern National Bank. The company have secured a 7-acre factory site at Chicago Heights, adjoining that covered by the Walburn & Swenson Works. Work will begin on a brick factory building at once, and the company agree to employ 200 men in the manufacture of Agricultural Implement Specialties.

The Columbia Engine Company of Cincinnati, it is announced, have signed contracts to locate their works at St. Charles, Ill. They manufacture hot-air engines of from 1 to 3 horse-power. The inventor, Mr. McKinley, will remove with the factory and superintend the works. St. Charles has now eight large factories in operation and three more located and building.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 18, 1893.

The course of the market during the past week may be summed up in a few words: "Iron firmer, Steel weak and a shade lower." The general situation, however, is practically unchanged, and so far as any one can see is not likely to change to any very important extent. The most notable feature is the steady absorption of stocks of Pig Iron, and the possibility of an unexpected advance in case there is no change in the proportions between supply and demand. At present it is perfectly clear that we are using more Pig Iron than we are making, which of course cannot continue much longer without affecting prices. On the other hand, Steel shows signs of weakening, which may in some measure offset the strength in Iron. However, a good deal will depend on developments during the next 30 days, so that it is impossible for any one to say for certain what course the market will take. It will not require any very great amount of new business to make things very active. There is enough on hand to give a splendid backing, all that

is required is to take deliveries on lots already sold. The Ore situation is still in abeyance, but the impression is that prices will not change to any very important extent. There is some talk of an attempt to advance freights on Soft Coal, and on Ores, but the thing is so absurd and so unreasonable that it is hardly likely that it will amount to anything. Eastern mills and furnaces are already so badly handicapped that any further steps to increase cost could only result in a wholesale shutting down and blowing out. Taking everything into account, we should be inclined to say a little higher prices are not unlikely for Foundry and Mill Irons; perhaps a little lower for Steel stock, but with prompt specifications for the Finished Material contracted for during January and February, we may see better prices for Plates, Shapes, &c., which at present are at the lowest on record.

Pig Iron.—Both Foundry and Mill Irons appear to be in a good position; and while there is no quotable change in prices, they are distinctly firmer, and with a continuance of present conditions will probably soon work to a higher level. All the best known brands are close sold up; some, indeed, are engaged up to the fall months, so that it is a matter of favor more than business to be able to place an order at current quotations. Medium brands are also pretty well cleaned up, while the very low qualities have also been liberally taken, but at extremely low figures. One lot of about 10,000 tons is said to have been secured at a very small fraction over \$12, Philadelphia, but the cleaning-up process has been so thorough that there is now really very little Iron of any kind to be had at less than quoted rates. The situation is in fact a very comfortable one for sellers, inasmuch as they are not heavily loaded with stocks, while there is a demand at prices which can be pretty accurately calculated upon. At the same time, there is nothing specially urgent in the demand, neither are consumers in the least alarmed at the possibility of a scarcity. The capacity for production is so large that every 25¢ advance in prices will add to the supply, while a dollar might again lead to an undesirable surplus. Under these circumstances, the situation attracts no unusual attention, and, barring the possibility of slightly higher prices for the better grades of Foundry and Mill Irons, there is nothing to indicate any decided change from the figures recently ruling, which in ordinary cases are quoted as follows for Philadelphia and equivalent deliveries, with 25¢ @ 50¢ less on Southern brands at Harrisburg and intermediately to Baltimore:

American Scotch, No. 1X.....	\$16 00 @ \$16 50
American Scotch, No. 2X.....	15 00 @ 15 50
Standard Penna. (Lake Ore), No. 1X.....	14 75 @ 15 25
Standard Penna. (Lake Ore), No. 2X.....	14 25 @ 14 50
Standard Virginia, No. 1X.....	14 50 @ 14 75
Standard Virginia, No. 2X.....	13 75 @ 14 00
Virginia and Southern, No. 1X.....	14 00 @ 14 50
Virginia and Southern, No. 2X.....	13 25 @ 13 50
Standard Penna. and Virginia Forge.....	13 00 @ 13 25
Ordinary Forge.....	12 50 @ 12 75

Freights.

Alabama Furnaces, Rail to Philadelphia.....	\$4.31 @
Alabama Furnaces, Rail and Water to Philadelphia.....	4.01 @
Alabama Furnaces, Rail to Baltimore and Harrisburg.....	4.06 @
Virginia Furnaces, Rail to Philadelphia.....	2.25 @ \$2.75
Virginia Furnaces, Rail to Harrisburg.....	1.50 @ 2.00
Virginia Furnaces, Rail to Baltimore.....	1.75 @ 2.25

Steel Stock.—There is very little demand and prices are unchanged at \$15 @ \$15.25, delivered, for Ordinary Bessemer; \$16 @ \$16.25 for Standard Bessemer, and \$17.50 @ \$17.75 for Low Phosphorus.

Steel Billets.—The market is easier and the little business done has been at

ower prices. Nominal quotations are \$24.75 @ \$25, delivered to nearby mills, but the only sales reported were are \$24.50 for Western Steel. The feeling is very unsettled, and large buyers seem unwilling to pay even \$24.50, unless for material that is absolutely required, consequently, there is not much bidding, neither is there any unusual pressure to sell. Holders are evidently disposed to realize at \$24.50 @ \$24.75, when they get a chance; but they are not forcing the market, seeing that it would only result in lowering prices without increasing the volume of business. Eastern Steel is held at \$25 @ \$25.25, delivered, but there is not much new business around.

Steel Rails.—The demand is not large, but there is enough doing to keep the mills fairly employed. The electric roads are taking quite a good number of Rails and are likely to become an important factor in the near future. Some 50,000 tons have been sold this season, and it is said that negotiations are pending for as many more for delivery during the summer and fall months, price varying from \$34 to \$36 for Girder Rails. Standard Sections are unchanged at \$29, f.o.b. cars mills.

Muck Bars.—There is no demand of any account, so that prices are merely nominal at \$22.50 @ \$23, f.o.b. cars asked.

Bars.—There is no special change in Merchant Bars, prices for which vary according to quantity, quality, delivery, &c. Some mill's are said to be quite busy at 1.62½¢ @ 1.65¢ for City Iron; others in the interior quote 1.55¢ @ 1.60¢ and sometimes less than the inside figure when the order is of sufficient magnitude to make it worth competing for. At best business is very unsatisfactory, and prices as low as at any time on record. Steel Bars, 1.55¢ @ 1.90¢, according to quality.

Skelp.—There is no change in either price or demand and nothing to indicate change in the immediate future. Sales to a moderate extent are made at 1.52½¢ @ 1.55¢, delivered, for Grooved. Mills fairly employed at these prices.

Plates.—The demand is fair, but there is nothing pressing, so that buyers can easily place their orders at the old figures. Most of the large mills are heavily loaded with business, but the delay in specifying is very disappointing, as they may probably be in a better position to handle the work now than later on. On the whole, the past week has not developed any change in the situation, and in many cases it is simply a day-to-day business, and extremely low prices at that. General quotations (delivered) are given as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.85¢	1.80 @ 1.85¢
Shell.....	2.10 @ 2.20¢	2.10 @ 2.20¢
Flange.....	2.70 @ 2.90¢	2.25 @ 2.40¢
Fire Box.....	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities.....	3.25 @ 3.75¢	3.25 @ 3.75¢

Structural Material.—There is not much new business coming in at present, and what little there is is sharply competed for at low prices. Mills have considerable work on hand, however, so that they are running pretty full, and are likely to continue doing so all through the summer months. Nominal quotations are about as follows, but on large orders special rates are made: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.80¢ @ 1.85¢; Universal Plates, 1.80¢ @ 1.90¢.

Sheets.—There is a good inquiry for all kinds, and although prices are low, mills manage to keep full of work. Iron appears to be coming into favor again, and sales are on quite a liberal scale. One order for several hundred tons of light Iron from Valejo, Cal., was taken by Alan Wood Company of this city. Upward of a score of bids to furnish Steel at lower prices were put in, but the A. W. Iron had the preference, so that the order came

to Philadelphia. Best Sheets in small lots are quoted about as follows:

Best Refined, Nos. 14 to 20.....	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....	3.15¢ @ 3.20¢
Best Refined, No. 27.....	3.30¢ @ 3.40¢
Best Refined, No. 28.....	3.40¢ @ 3.50¢
Common, ¼¢ less than the above.	

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than here named:

Best Soft Steel, Nos. 14 to 16.....	2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20.....	2½¢ @ 3¢
Best Soft Steel, Nos. 21 to 24.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28.....	3½¢ @ 3½¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.70 and 5¢ @ 70 and 10¢

Old Material.—The market remains in the same dull and unsatisfactory condition as noted for several weeks past. Sales cannot be forced without breaking prices, but ordinarily business can be done at the following figures, say: Old Iron Rails, \$18 @ \$18.50, delivered; Old Street Rails, \$19 @ \$19.50; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$15 @ \$16, Philadelphia, or for deliveries at mills in the interior, \$15.50 @ \$16, according to distance and quality; \$8 @ \$9 for clean new No. 2 Light Scrap; \$7.50 for old No. 2 Light Scrap; \$11.50 @ \$12 for Machinery Scrap; \$12 @ \$12.25 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Wrought-Iron Pipe.—At a meeting of the Manufacturers' Association, held in New York City last week, a few slight changes were made both in the list price and in the discounts, the latter being as follows:

Butt-Welded Black.....	.60 ¢
Butt-Welded Galvanized.....	.50 ¢
Lap-Welded Black.....	.67½ ¢
Lap-Welded Galvanized.....	.57½ ¢
Boiler Tubes, 2½ inches.....	.65 ¢
Boiler Tubes, 3 inches.....	.67½ ¢

(By Telegraph.)

There is considerable inquiry for Car-Building material, also for light Poles for Trolley lines. Some good orders have been taken by Schuylkill Valley mills.

Baltimore.

BALTIMORE, April 18, 1893.

Business here for the past week in the Iron and Steel line has been quite active, but purchases have been confined chiefly to a hand to mouth basis, and orders for large lots, while very scarce, have been placed at the usual low prices that rule when the market is in this condition. There seems to be no bottom to the prices of Plates, as they have gone to lower figures than has been the case for a long time. The action of the Tube and Pipe makers seems to have stimulated this market somewhat, and prices have ascended.

Bars.—No change can be reported in this article; for stock deliveries we have the following as a good average of quotations: 1.80¢ @ 2¢, and from mill 1.75¢ @ 1.80¢.

Plates.—There have been several fair lots placed in this market, but at very low figures, and we quote for Tank Steel, 1.80¢; Shell, 2.15¢ @ 2.25¢; Flange, 2.30¢ @ 2.40¢; Fire Box and Marine, 2.45¢ @ 2.55¢.

Merchant Steel.—There has been considerable inquiry and business in this line, especially in Tire Steel, and we quote firm at the following figures: Machinery, 2.10¢ @ 2.25¢; Tire, 2.05¢ @ 2.15¢; Spring, 2.40¢ @ 2.50¢; Toe Calk, 2.35¢ @ 2.40¢.

Tubes.—As noted above, the action of the Tube makers has done considerable to stimulate demand and a raise in prices.

We now quote for Boiler Tubes 2 to 2½ inches at 65 ¢ off, 3 to 4 inches at 67½ ¢ off.

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, April 19, 1893.

Pig Iron.—The local demand does not show any marked improvement and prices are the same as last quoted. There continue to be offered, however, Irons at prices a trifle below current rates which tends to depress the market and naturally adversely affects the price of the better class of Irons. The market has been continually drooping until consumers have come to believe that there is no chance of any improvement and they naturally regulate their purchases accordingly, buying in limited quantities and thus placing themselves in position to take advantage of every additional cut in price which is offered. During the week under review sales were limited at prices as quoted below. The immediate future does not contain anything that may be called encouraging and unless the demand shows rapid improvement a lower range of prices will be in order. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$13.50 @ \$14.00
Southern Coke, No. 2 Foundry.....	12.25 @ 12.50
Southern Coke, No. 3 Foundry.....	11.75 @ 12.00
Southern Gray Forge.....	11.25 @ 11.50
Southern Car Wheel.....	18.00 @ 18.75
Lake Superior Car Wheel.....	17.00 @ 17.50
Ohio Softeners.....	16.25 @ 17.00
Missouri Charcoal, No. 1 Foundry.....	13.50 @ 14.00

Bar Iron.—A steady improvement continues the feature in this department and mills are not begging for orders as formerly. Jobbers report a heavy trade, and prices are well maintained at 1.75¢ for medium sized lots; mills quote 1.57½¢ @ 1.60¢, half extras, f.o.b. cars East St. Louis.

Barb Wire.—The heavy demand for Barb Wire continues and Plain Wire is also in urgent demand; in fact, mills are rushed to fill their orders promptly. Prices are well maintained, and as the heavy spring demand is yet to be heard from an advance in prices seems quite reasonable. We quote car lots to jobbers as follows: Painted, \$2.20; Galvanized, \$2.60.

Wire Nails.—There is no cessation in the demand for Wire Nails, and both jobbers and mills are rushed with orders. Mills are running at their full capacity and report their warehouses as almost bare of stock, and as nearly all orders received call for prompt shipment the outlook for higher prices can be called encouraging. Mills quote carload quantities to jobbers at \$1.70 rate. Jobbers ask \$1.75 @ \$1.80, according to quantity.

Pig Lead.—Under the stimulus of heavy buying prices have been advanced to 3.95¢, with 4¢ being paid for single car lots for immediate delivery. Offerings are limited and the market is in a very strong position. An order for a good round lot would advance prices still higher. The large consumers, however, refuse to bid more than 3.90¢, and it is possible that some reaction will shortly be in order.

Spelter.—This metal fails to move, in sympathy with Pig Lead, and sales are made on the basis of 4.05¢ for delivery extending over the next 60 days. Stocks continue to accumulate, and offerings are free at from 4.05¢ to 4.07½¢, with few buyers at these figures.

Pig Iron.	Freight Rates.	Per ton.
Birmingham, Ala., to St. Louis.....		\$3.25
Chattanooga, Tenn., to St. Louis.....		3.00
Sheffield, Ala., to St. Louis.....		2.80
South Pittsburg, Tenn., to St. Louis.....		2.87

Barb Wire and Wire Nails.	Per cwt.
Pittsburgh, Pa., to St. Louis.....	18½¢
Salem, Ohio, to St. Louis.....	16½¢
Cleveland, Ohio, to St. Louis.....	15¢
Anderson, Ind., to St. Louis.....	11¢

Wm. H. Brown's Sons, St. Louis, Mo., have just closed a contract with the Laclede Gas Light Company, St. Louis, for 1,000,000 bushels of Youghiogheny second pool Gas Coal. M. W. Warren, the St. Louis agent for this concern, is to be congratulated upon closing this contract.

Boston.

Office of *The Iron Age*, 146 Franklin St.,
BOSTON, April 18, 1893.

The boilermakers' strike is the feature in the iron market here. The workmen are still out, and it is an assured fact that trade is being driven away from Boston by this strike. Orders for five large boilers are known to have gone to other cities in the West to be made. The boilermakers in New Haven and Pawtucket are said to be at work ten hours for a day's pay, and work is going to these cities. It is bad for Boston to lose the work, but it is harder for the Boston boilermakers in the long run, for such work once driven away is not likely to return. There is little doubt but what July 1 will bring some trouble for the iron manufacturers, and the heaviest concerns of contractors, builders and agents here are getting all the contracts fixed that it is possible to fix, not caring to take any of the chances of higher iron, owing to labor troubles. Well-posted agents here and in the West agree that wages at Pittsburgh will be reduced on July 1, and also that the Amalgamated Association is already organizing "little strikes" in order to make manufacturers dread labor trouble as much as possible. The same agents agree that there is trouble in the air, but how it will result is a question they are not able to answer.

Pig Iron.—The market on Pig Iron is quiet. There is a good amount of trade, for the foundry people are very busy, but the offerings of iron are such that they buy when they please and at prices generally in their favor. Still agents and dealers explain that quotations are not changed, nominally. Southern Iron ex-dock in Boston is quotable at: No. 1, \$15 @ \$15.50; No. 2, \$14 @ \$15; No. 3, \$13.50 @ \$14. Virginia Iron is still a feature in this market, with the quotations at \$15.50 for No. 1. Pennsylvania Iron is very quiet, with the quotations on iron at shipping port at: No. 1, \$15; No. 2, \$14.50; Gray Forge, \$13 @ \$13.50. Western Irons are still being used, with the quotations at \$17 @ \$19 for iron delivered in Boston.

Bar Iron.—The Bar Iron market is quiet and steady. The negotiations for running the Warr mill, at Wareham, mentioned last week, fell through, but now it is well understood that another company have made the estate a definite proposition for running the concern a stated number of years for a stated sum, but that the laws of Massachusetts prevent the acceptance of this proposition till the estate is fully settled. In the meantime the mill is running and completing iron under the old contracts. It is also hoped in the trade that some concern will soon be in position to accept of new contracts. Bar Iron is quotable at: Ordinary Old Material Bars, from mill, 1.60¢ @ 1.65¢; from store, 1.65¢ @ 1.70¢. Best Puddled Iron Bars are quoted at 1.85¢ @ 1.95¢ from mill; from store, 2.15¢ @ 2¼¢. Norway and Swedish Bars are quiet, with the market at \$65 @ \$67 ton for Bars and Shapes.

Building Iron.—Trade in Building Iron and Steel continues good, but after all some of the large contracts expected to

have been placed ere this are still in negotiation. The Boston Bridge Works have just secured a contract for some 150 tons of iron for a drawbridge for the Boston & Maine Railroad at the Charles River, in connection with the new terminal station that company are building. The same concern have also a contract for all the Wrought Iron in the new head works of the station. Other Boston contracts are under way. Building Iron is nominally unchanged in quotations at: Beams and Channels, 2.07½¢ @ 2.20¢ from mill; from store, 2¼¢ @ 2.30¢; Tees, 2.40¢ @ 2½¢ from mill; from store, 2½¢ @ 2¼¢.

Steel, Steel Plates and Steel Rails.—Billets are admitted to be a little easier at Pittsburgh, and this is having some effect on the position of Manufactured Steel, and yet the trade claims that the market is very fairly sustained. Here the quotations are: Bessemer Steel, 2.05¢ @ 2.20¢; Machinery, 2¢ @ 2.15¢; Tire and Sleigh Shoe, 2¢ @ 2.05¢; American Cast, 7¢ @ 7¼¢; English Cast, 13¢ @ 15¢; American Steel Rails, \$29 at mill. The demand for Steel Rails continues quiet. There is some trade in light sections, but heavy sections are dull. Steel Plates are more quiet, by reason of the boilermakers' strike, and the position of the market as to prices is slightly easier: Tank, 1.90¢ @ 2¢; Shell, 2¢ @ 2.10¢; Flange, 2¼¢ @ 2.35¢; Fire Box, 2.60¢ @ 3.25¢.

Nails.—Nails are in good demand, though the supply is ample. Prices are steady at \$1.50 @ \$1.60 per keg for Cut Nails. Steel Wire Nails are in good request, with no changes in prices.

Pipe and Tubes.—Pipe is firmer from the fact that the meeting in New York last week put up prices 2½¢ on some classes. This has started trade a little and business is better. Boiler Tubes are very dull, by reason of the boilermakers' strike, but the quotation is steady at 65¢ off from list in all sizes.

Scrap Iron.—Scrap Iron is only steady. The lower grades are not looking quite as firm, since there is some doubt concerning the running of the Warr mill, mentioned above. No. 1 Wrought is quotable at 55¢ @ 60¢ per 100 lb, with choice selections, including old Horse Shoes, at 60¢ @ 70¢. Light Iron is quoted at 30¢ @ 40¢, with machine shop Scrap at 25¢ @ 30¢ for Cast and at 30¢ @ 35¢ for Wrought.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, April 19, 1893.

There has been a slow and easy Pig Iron market during the week, the demand being mainly restricted to the current consumptive necessities of consumers, who as a rule are indisposed to anticipate their wants, and while some of the stronger Southern Iron companies are not disposed to accept orders for long forward delivery at current prices, yet orders can be placed for delivery all this year for No. 2 Foundry at \$9 and for Gray Forge at \$8 f.o.b. Birmingham. There is a fair inquiry for Mottled Neutral Coke Iron, and, it being in light supply, it sells pretty close up to Gray Forge. The reduction in stocks during the month of March does not seem to have any influence upon the market, probably because the capacity of the furnaces in blast or available for production is large enough to meet all probable demand. There is no demand for Charcoal Iron except in a retail way, and even that is scarcely of the usual proportions. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$13.25 @ \$13.50
Southern Coke, No. 2.....	11.75 @ 12.00
Southern Coke, No. 3.....	11.00 @ 11.25

Ohio Soft Stone Coal, No. 1....	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2.....	15.00 @ 15.25
Mahoning and Shenango Valley...	14.75 @ 15.00
Hanging Rock Charcoal, No. 1....	19.00 @ 19.25
Hanging Rock Charcoal, No. 2....	18.00 @ 18.50
Tennessee and Alabama Charcoal,	
No. 1.....	15.50 @ 15.75
Tennessee and Alabama Charcoal,	
No. 2.....	14.50 @ 14.75

Forge.

Gray Forge	10.75 @ 11.00
Mottled Neutral Coke.....	10.65 @ 10.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	18.00 @ 19.00
Lake Superior Car Wheel and Malleable	17.75 @ 18.00

Cleveland.

CLEVELAND, OHIO, April 17, 1893.

Very little has been done during the week just closed. An occasional sale aggregating 5000 or 10,000 tons has been reported, but none of the heavy buyers have dipped into the market to any considerable extent. It is reasonably certain that good Bessemer Ores are being sold as low as \$3.85 per ton, f.o.b. cars lower lake ports, and there are rumors that the Carnegie interests are endeavoring to buy as low as \$3.70 @ \$3.75. Until the Pig Iron market shows signs of improvement there seems little likelihood of any very pronounced demand for Ore, although last season 5,000,000 or 6,000,000 tons had been disposed of before a corresponding date. The effort to resell Bessemer Iron seems to have had its effect in checking the demand for Ore, which two weeks ago gave promise of rapid progress. Local dealers are watching the market prices of the crude products with keen interest, believing, as suggested editorially by *The Iron Age* last week, that these are having an influence upon the market. The non-Bessemer Ores on the docks are being cleared up quite rapidly, several large sales having occurred during the week just closed at figures ranging from \$2.75 to \$3.50 per ton. The Ores commanding the last-named figure were just outside the Bessemer limit, and when mixed with the cheap non-Bessemer make a profitable Ore. Although dealers take a hopeful view of the situation, there is an inclination to admit that the early season guesses of an average cut of 50¢ per ton from the prices prevailing in 1892 were quite nearly correct. Lake freights have not been fixed, but the current talk is favorable to a schedule of rates based on \$1.10 per ton for Ore, Ashland to Cleveland. The maximum estimates of the sales of Ore of all kinds to date is 1,000,000 tons, about one-tenth of the probable output of the season.

Mr. Curry, representing the Carnegie interests, said Friday: "We have not solicited negotiations with the Ore sales agents. Some of them came to us several weeks ago and said they were desirous of fixing prices on Ore in order to make up their minds as to whether they would work their properties to full capacity or cut down the mining force. We told them that we were not ready to buy, but offered \$3.50 for standard Gogebic Bessemer. We have not changed our position in the matter, and see no reason at present for a change, although we understand that the Aurora and one or two other companies mining standard Bessemer have sold a portion of their 1893 product at \$4, the price asked by the Ore dealers. We bought some Ore—not a very large amount—last week at our price."

Dealers in the Perry-Payne Building say that the Ore purchased was from the Menominee Range, probably the Pewabic Mine. The purchasers own a half interest in this mine and the deal would have little effect upon the market as a whole. The Pewabic Ore is of a special grade and is generally mixed with low-grade non-Bessemer in the production of Bessemer

Iron. Sales of Chapin Ore at \$3.65 $\frac{1}{2}$ ton are announced, practically the figures prognosticated in these quotations several weeks ago. This is a reduction of 55¢ $\frac{1}{2}$ ton from last season's early figures. The Ore dealers, basing their claims on the fact that the stock of Pig Iron was reduced in March to nominal figures, still quote the best Gogebic Bessemer at \$4 $\frac{1}{2}$ ton, f.o.b. Cleveland. At the same time good Bessemer Ores are said to be selling—in small quantities, it is true—at \$3.85 @ \$3.95, with an occasional sale as low as \$3.75, f.o.b. lower lake ports.

Iron Ore.—Navigation opened to-day, seven vessels having been reported as passing through the Straits. Still lake freights make up the uncertain quantity in fixing Ore quotations. The local organ of the vesselmen, *The Review*, says: "No lake freight contracts have been made, and the vessel owners who understand the relations between the Ore dealers and Pig Iron manufacturers seem satisfied to await the outcome of the differences without urging matters. On account of the inactivity in Ore, the grain freight market is weaker, however, a number of boats having been chartered for 3 cents from Duluth to Buffalo. From Duluth to Kingston, 5 cents is offered. There is some fear of trouble at Buffalo on account of a rush of grain at the opening, but it would probably be as well that such should be the case, as the prospects in Iron Ore seem certain to improve with delay in the opening of navigation. Coal carriers are in active demand at both Buffalo and Cleveland with the opening rates strong on all upper lake shipments."

During the week 36,000 tons of Ore were sent forward to the furnaces, as compared with 28,000 tons for the same week in 1892. Despite the wildly inaccurate reports telegraphed out from Cleveland, agents of such standard Ores as the Norrie, Iron Belt, Ashland and other Gogebic properties declare that the selling season has not fairly begun, and that the sales thus far recorded are no criterion by which to judge the prices to be paid for the 8,000,000 or 9,000,000 tons of Ore still to be sold. Active operations are not looked for before May 5, when navigation will probably have been opened to the head of Lake Superior.

Pig Iron.—Prices are only moderately firm at \$13.80 @ \$13.90, with a fair demand. A few sales at figures close to \$13.80, Cleveland, are reported, but the market is not active and stocks seem a little heavier than during the past month. Gray Forge, at \$12.25, Cleveland, is in fairly good demand. Foundry Irons seem a trifle weak at \$12.75 @ \$13 for No. 2 and \$13.50 @ \$13.75 for No. 1. The furnacemen take a hopeful view of the situation and seem to believe that the outlook is favorable for better prices before May 1.

Muck Bar.—The market is devoid of life and prices have declined to about \$24 @ \$24.10. A sale of a small amount of Muck Bar at the first-named figure is reported, but the market as a whole is very dull.

Nails.—A very good demand for Wire Nails at the new rate—\$1.55 per keg, car-load lots, Cleveland or Pittsburgh, is reported. Cut Nails are selling freely, but there are rumors of rate cutting from many sources.

Scrap.—Little business is being done. Dealers quote: \$15 $\frac{1}{2}$ ton for No. 1 Railroad Wrought; \$11 $\frac{1}{2}$ ton for Cast Scrap; \$10 $\frac{1}{2}$ ton for Wrought Turnings, and \$7 $\frac{1}{2}$ ton for Cast Borings.

Old Wheels.—An occasional sale of Old Wheels at \$14 $\frac{1}{2}$ ton, Cleveland, is reported, but the market is dull.

Louisville.

LOUISVILLE, KY., April 17, 1893.

There has been a fair amount of buying, but at low prices, and sales are reported under present figures where for prompt shipment. Most transactions, however, at low prices have been traced to a company who were desirous of closing up Iron on hand, as they are reported to be going out of blast. As this company have been very free sellers under the market for some time, it is felt that prices can be better controlled from now on. Sales of No. 2 Foundry at \$9 are frequent where for prompt shipment, but for long deliveries \$9.25 is asked.

Rolling mills are complaining, and outside of car companies, that are running night and day, business is not active.

Car Wheel Irons are in little demand.

We quote for cash, cars Louisville:

Southern Coke, No. 1 Foundry...	\$12.75 @ \$13.25
Southern Coke, No. 2 Foundry...	11.50 @ 12.00
Southern Coke, No. 3 Foundry...	11.00 @ 11.25
Southern Coke, Gray Forge...	10.50 @ 10.75
Southern Charcoal, No. 1 Foundry	15.00 @ 16.00
Southern Car Wheel...	17.50 @ 17.75
Spathite	12.25 @ 13.25

New York.

Office of *The Iron Age*, 96-102 Reade street, }
NEW YORK, April 19, 1893. }

Pig Iron.—Makers of standard Northern brands report a very good run of business, while agents of some of the other furnace interests, North, and South, report that current business is confined practically to carload orders. Reports of cutting are again heard, the most conspicuous case being the offering of No. 2 Southern Iron by a prominent maker to consumers direct at \$9, Birmingham. We quote Northern brands at \$14.50 @ \$15.25 for No. 1; \$13.75 @ \$14.50 for No. 2; \$12.50 @ \$13 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.25 @ \$14.50 for No. 1; \$13 @ \$13.50 for No. 2 and \$13.25 @ \$14 for No. 1 Soft; \$12 @ \$12.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—The market is exceedingly quiet, with the following as the nominal quotations: \$22 @ \$22.50 for 10% and \$25 @ \$25.50 for 20% Spiegeleisen, and \$57 @ \$57.50 for 80% Ferromanganese. The Cambria Iron Company have received the first cargo of Caucasian Ore, and will go into the manufacture of Ferro.

Billets.—The market is exceedingly dull. We quote nominally domestic Billets, tidewater, \$25.25 @ \$25.50; foreign, nominally, \$29 @ \$29.50; domestic Wire Rods, \$33.50 @ \$34; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$52 @ \$53.

Steel Rails.—The market is exceedingly quiet for new orders, nothing of any consequence having come up for the Eastern mills. There is more and more talk of considerable blocks of Steel Rails fit to relay, taken out of the tracks of some of the leading roads, which have been forced to put down heavier Rails. About \$20 is what is quoted for this class of material. Standard Rails are still quoted \$29 at mill or tidewater and Girder Rails \$31.50 @ \$33. In the West, important sales have been made, the Colorado mill having captured an order for 25,000 tons from the Burlington, and the same mill is reported to have taken 10,000 tons from the Santa Fe.

Track Material.—The market is dull and weak. We note a sale of 400 to 500 tons of Fish Plates by an English mill to a Canadian road at 1 $\frac{1}{2}$ ¢, c.i.f. New York. Spikes are quoted at 1.85¢ @ 1.95¢; Fish Plates at 1.50¢ @ 1.60¢; Track Bolts, square nuts, at 2.4¢ @ 2.50¢, and hexagon nuts at 2.5¢ @ 2.60¢, delivered.

Manufactured Iron and Steel.—Business during the week has been light, and no contracts of consequence have been closed during the week. Among the larger orders to come up is the Bloomingdale Building, on Fifty-ninth street. Prices continue irregular, and in Structural Material and Beams display a tendency to weakness. On Plates a very low figure for a moderate export order was made lately. We quote: Beams up to 15 inch, 1.90¢ @ 2.15¢; 20-inch, 2.25¢ @ 2.40¢ for round lots; Angles, 1.8¢ @ 2¢; Universal Mill Plates, 1.85¢ @ 1.90¢; Tees, 2¢ @ 2.20¢; Channels, 2¢ @ 2.10¢, on dock. Car Truck Channels, 1.90¢ @ 2.10¢. Steel Plates are 1.80¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.25¢ @ 2.50¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock, and common 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.80¢ @ 1.90¢, delivered; Cotton Ties, 80¢ $\frac{1}{2}$ bundle, at mill.

Merchant Steel.—The market is dull, with Machinery at 1.75¢ @ 2¢; Toe Calk, 2¢ @ 2.25¢; and Sleigh Shoe, 1.75¢ @ 1.90¢.

Old Material.—The negotiations for the closing out of a lot of 4000 tons of special make Old Iron rails have been concluded. They were from a coal road to a Western mill, the terms being private. We quote Old Iron Rails \$16.25 @ \$16.50, on cars Jersey City, and Old Steel \$12.75 @ \$13.

Metal Market.

Copper.—Some contracts have been made for Lake Superior Ingot for future delivery. As to the quantity of Metal involved and the prices paid, secrecy is observed. In this particular the large producers are as non-committal as they are regarding the amount of Copper on hand, and through this perverseness encourage suspicion regarding what little information does come to the surface regarding the true status of the market, besides developing suspicion as to accuracy of statistics of production. In short, there is strong circumstantial evidence of manipulation in more directions than one, not the least among which is the dissemination of misleading reports as to true market value. For example, the word is dropped that the leading producers are not sellers at less than 11 $\frac{1}{2}$ ¢. That and higher prices were quoted some time ago, but there is reason to believe that good-sized orders have been taken recently at 11 $\frac{1}{2}$ ¢ if not at a lower price, or at concessions from "nominal" prices that have been the rule for several months in certain quarters. In support of this is the fact that "outside" lots have gone a begging at 11 $\frac{1}{2}$ ¢ and that distant future deliveries were offered on the Metal Exchange at as low as 11.15¢ without stimulating inside or outside speculation to the slightest extent. Upon the whole it would appear that the restriction of output has thus far had little effect outside of preventing prices from falling to a normal point. Casting Copper is generally quoted at 10 $\frac{1}{2}$ ¢, but desirable orders at $\frac{1}{2}$ ¢ less would probably be clinched, and it is not certain that bids of 10 $\frac{1}{2}$ ¢ for large blocks would be refused. Some Lake Ingot has been sold for export at 11 $\frac{1}{2}$ ¢, and it is understood that negotiations involving 5000 tons are under way.

The monthly production of Copper in the United States since July has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal lake, Montana and Arizona producers; the second being the metal from pyrites and from a

number of smaller outside sources, being estimated:

American Product.			
	Reporting mines.	Outside sources.	Total.
1892.	Gross tons.	Gross tons.	Gross tons.
July	9,294	824	10,218
August	10,807	870	11,677
September	9,710	994	10,704
October	9,068	1,239	10,307
November	9,888	1,030	10,918
December	9,872	1,174	11,046
Total			
six months	59,239	6,287	65,526
1893.			
January	9,187	989	10,176
February	8,213	1,042	9,255
March	9,065	1,321	10,386

The product of the foreign reporting mines was as follows:

Foreign Reporting Mines.		Gross tons.
1892.		
July		6,358
August		6,888
September		6,478
October		6,476
November		6,789
December		7,066
Total six months		39,655
1893.		
January		5,730
February		6,762
March		6,896

The exports of fine Copper from the United States were as follows:

United States Exports.		Gross tons.
1892.		
July		3,450
August		1,545
September		1,458
October		3,144
November		3,897
December		4,486
Total six months		17,980
1893.		
January		3,171
February		1,815
March		2,334

Pig Tin.—The "bull" interest in the speculative arena have had a new card in the shape of advices by wire of shipments of only 775 tons from the Straits during the first half of April. They also had some assistance from London in the form of stiff quotations there for prompt and near future deliveries. Neither circumstance has, however, counted for much against the natural weight of excessive supplies on this side of the Atlantic and strong circumstantial evidence that no opportunity is missed in this or the foreign markets to transfer holdings. At present, London is selling futures at a heavy discount, while a considerable premium is still maintained by the local manipulators. The natural deduction from this is that the United States is destined to be the dumping ground for a large amount of Tin attracted from the primary sources of supply by the McKinley tariff law. Trade demand is running slower at present than it has for some little time past, chiefly for the reason that jobbers are quite liberally stocked, and purchases for consumption are on a more restricted scale also, although very fair in the aggregate amount. At the close of the week prices softened to 20.65¢ @ 20.70¢, net cash, for 10-ton and larger lots, and buying interest was very tame.

Pig Lead.—The higher prices established on last week's transactions have been maintained, but buyers have become more cautious and the volume of business for the period under review makes a very indifferent showing. Spot offerings are moderate, however, as are also round lots for near future shipment from the West and at less than 4.17¢ there is little Lead on sale. The popular quotation at this writing is 4.15¢ bid, 4.20¢ asked.

Spelter.—Sales have been made of car-load lots at 4.40¢ delivered here and at other Eastern points. At this writing 4½¢ is generally asked and the indications are that no considerable quantity of the metal can be secured at the intermediate price. The rise is due chiefly to steady consumption that is now quite on a level with the production and apparently ahead of late

calculations. Efforts to effect a combination of producers have been renewed, but thus far it does not appear that the market has been affected thereby.

Antimony.—Outside of routine jobbing sales there has been little doing, and the demand at present is slow. Prices remain quite steady, however, at 10½¢ for Hallett's, 10½¢ @ 10½¢ for L.X. and 10½¢ @ 10½¢ for Cookson's.

Tin Plate.—Coke Tins, of 100 lb and lighter weight, have realized very good prices, unsold supplies of the same being under close control at the moment. Other varieties have merely held their own, however, since supply and general assortment is now somewhat fuller. Still the change in prices is narrow, and without sign of the supply becoming at all burdensome. Spot quotations are as follows: Coke Tins—Penlangrade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, \$5.50; light weights, \$5.10 @ \$5.12½ for 100 lb, \$5 for 95 lb, \$4.90, nominal, for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85. Charcoals—Melyn grade, IC, \$6.50; Crosses, \$8; Allaway grade, IC, \$5.70; Crosses, \$6.90; Grange grade, IC, \$5.80; Crosses, \$7. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.25; do., 20 x 28, \$14.50; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.70; D. R. D. grade, 14 x 20, \$5.20; do., 20 x 28, \$10.30; Wasters—S. T. P. grade, 14 x 20, \$5; do., 20 x 28, \$9.70; Abercane grade, 14 x 20, \$4.95; do., 20 x 28, \$9.50. Back Plates for tinning, to arrive, are quoted at \$3.65 @ \$3.70 for IX, and \$3.70 @ \$3.75 for IC, to arrive.

Financial.

The condition of the United States Treasury is again the uppermost theme, the loss of gold by the outgoing European steamers having raised the question whether the parity of the two metals, gold and silver, can be maintained much longer. At the present time silver is a fraction below 38 pence in the London market. It is generally believed by Treasury officials that the order stopping the issue of gold certificates which was given last Saturday, and the expected gain in the condition of the gold balance, will preclude the necessity of an issuance of bonds. The majority of the bank officials in this city believe that the order referred to will have no direct effect on the situation. One bank president said: "The whole thing resolves itself into a formal announcement that the Government treasuries can no longer be used as a warehouse for gold coin. The step now taken should have been taken years ago; in fact, should have been arranged for simultaneously with the resumption of specie payments in 1879." Another bank president said: "The Secretary, in making the order, simply obeys the law. It was formerly designed to make speculation in gold impracticable by compelling traders to make deliveries in actual coin. This condition no longer prevails, and it is possible the step is simply the first movement in the direction of bond sales. A large amount of bonds are already printed and ready for delivery to agents of prominent European banking houses, who will ship gold to pay for them from the other side as soon as the issue is announced here." The continued export of gold to supply the Austrian demand, together with the probability that gold will go out for some time to come, causes an uncertainty of feeling detrimental to all interests, especially as the excess of foreign imports at New York is the largest ever known. At the same time the exports of breadstuffs, cotton, provisions, cattle

and oil in March were \$17,889,184 less than in the same month last year. On the other hand, low prices for cotton should stimulate exports of that staple, and enormous amounts of grain will come forward on the opening of navigation. The recent Australian failures, which in the aggregate are comparable to the Barings failure, tend to increase the stringency in Europe, and are an unfortunate coincidence as related to monetary affairs in the United States.

Returns of the foreign commerce of the entire country for nine months to April 1 are important. During March alone the imports of merchandise were \$26,000,000 in excess of the exports, and for nine months, specie excluded, there is an adverse balance of \$47,000,000, as compared with a favorable balance of \$209,000,000 for the same time in 1892.

Stocks generally declined, and, as a whole, are about on the same level as three weeks ago, influenced by currency questions. The common argument was that if the Treasury gold reserve was encroached upon serious disturbance might follow affecting all manner of securities. But for this situation there would be no cause for uneasiness. Toward the close the market was influenced by lower prices for Americans in London, inducing selling by the arbitrage houses for European account, and by news of a strike upon the Union Pacific and of threatened trouble on the Lake Shore, caused by the refusal of the company to reinstate the engineers who left the service of the company at the time of the strike on the Toledo, Ann Arbor & North Michigan.

United States bonds are quoted as follows:

U. S. 4½, 1891, extended	99½
U. S. 4s, 1897, registered	113
U. S. 4s, 1907, coupon	113
U. S. currency 6s	106

Money on call loaned at 6 and at 3 per cent., averaging about 4½, and there appeared to be an abundant supply. There was a good inquiry, especially on industrial and ordinary securities. Lenders, however, required a gold clause in the notes, and rates were firmly held at 6 per cent. The market for commercial paper was very quiet, with little or no inquiry from the city, and with only a moderate demand from out of town. Rates were 6 per cent. for the best names, ranging as high as 8. The surplus bank reserve amounts to \$11,000,000; the loans are 431 millions, against 493 millions at the same period last year.

The general markets are dull for the reasons above intimated and in the absence of speculation. One exception was coffee, which broke sharply under a bear raid, and business on Monday was larger than before for several years. The net decline was equal to \$1.50 @ bag. Cotton and wheat were also lower. Spot cotton was marked down 1½¢. In wheat the most notable feature is the area of the Indian crop, which shows an increase of 2,750,000 acres. Crop accounts from Texas are very good. Corn is up 6 or 8 inches, and oats are occasionally seen in head. West there is nothing in the general outlook for winter wheat to warrant as large a crop as last year's. Provisions are rather firmer. Anthracite coal is weak, while bituminous prices are well maintained.

For the nine months ending March, 1893, the exports of breadstuffs were \$145,032,000; for the corresponding nine months in the previous fiscal year they were \$233,159,000, a falling off in nine months of \$88,127,000. The decrease in the exportation of hog, beef and dairy products has been almost equally marked. For the nine months ending March 31 the exports of these products were \$27,300,000; for the corresponding nine months of the previous fiscal year, \$33,983,000, a falling off of \$6,683,000.

Coal Market.

Anthracite Coal is dull and easy, except Buckwheat and Pea, which are scarce, the former at \$1.85 @ \$2, f.o.b.; Pea, \$2.50 @ \$2.65, f.o.b. Stove and Chestnut are \$4.15 alongside, which is the net circular. The accession of Mr. Harris in the Reading management as yet has no effect on the trade. Large sales of Egg, Stove and Chestnut are reported at prices 25¢ under the circular. Bituminous Coal is quoted \$3.25, and prices are said to be well maintained. Western Coal prices will be considered April 25, and a meeting of freight agents to adjust railroad tolls to Western points will soon be held. The Bituminous operators report no later contracts.

The total Anthracite Coal production since January 1 is 10,814,000 tons, an increase of 887,000 tons compared with last year. The Reading Company is operating 51 collieries three-quarters time, and, having already a large tonnage piled up at tidewater, have begun to stock coal in the storage pockets near Mahanoy. The bituminous mines are active. Clearfield production for the week, 67,451 tons; Huntington, 45,755 tons; Norfolk and Western, 70,136. All regions are ahead of last year.

Contracts are about to be awarded for the construction of a Coal route direct from White Haven, Pa., to Albany via Hancock on the State line, a distance of 137 miles, upon a region hitherto undeveloped.

The Kelly Moon lands, near Big Stone Gap, Va., consisting of 1460 acres, were sold at commissioner's sale to John C. Haskell for \$75,960.

A road is proposed from Deposit, Delaware County, N. Y., to Erie, which will handle a large amount of Coal.

The joint conference of miners and mine operators of Ohio, held at Columbus, on Saturday, to fix the price of Coal mining for the year beginning May 1 next, adjourned in disorder and a strike is imminent.

Pittsburgh.

(By Mail.)

Office of The Iron Age, Hamilton Building, Pittsburgh, April 18, 1893.

The week under review did not present any special features. The few slight changes that occurred were in the direction of lower prices, particularly for Soft Steel. Bessemer Pig also showed further evidences of weakness during the week, and \$13.75, f.o.b. cars Pittsburgh, is a top price for this article to-day. A slightly better inquiry for Structural Shapes is reported, while in Plates the tonnage is only fair with prices ruling very low. Mills rolling Iron and Steel Bars are only moderately active, and extremely low prices continue to be named for desirable orders and specifications. The Wire Nail makers are considerably disturbed by well-founded reports to the effect that one large maker has been offering to sell, and in fact has already taken some orders, at about 10¢ per keg under the established price. The makers of Pipes and Tubes met in New York City last week and rearranged prices and discounts. Wire continues active with prices being firmly maintained. Nothing has been done by the Ore producers and consumers, and it is intimated that the requirements of one of the largest buyers will not be covered until the return of a prominent official of the concern from abroad, which is set for May 20 next. Summing up the entire situation, it would seem that the volume of business is fairly satisfactory, without any indications of better values being secured. A tremendous amount of material of various kinds is being turned out, but it is being well taken care of by the consumers, and if the

pace is continued, which it promises to be, it is the impression that the present standard of prices can be fairly well maintained. More or less anxiety will be felt in business circles from this time forward over the settlement of the wage scales. Interviews with prominent manufacturers in different branches of the trade indicate that if the workmen exhibit a spirit of fairness when the time comes to take up the different scales in conference, there will not be any difficulty in bringing about settlements that will be satisfactory to all concerned.

Ferromanganese.—A moderate demand is going and prices are without change, \$59, Pittsburgh, being quoted for 80 % domestic. A small lot of foreign was sold in this market recently at a price equal to about \$58 60, Pittsburgh.

Structural Material.—Makers advise us that within the past week slightly better inquiry prevailed, specifications coming in from architects, and the outlook for increased tonnage is quite favorable. No special contracts have been placed recently, nearly all the business going being confined to ordinary purchases which sum up a fairly large tonnage. We repeat prices of last week as follows: Beams and Channels, 1.65¢ @ 1.70¢, according to order. Angles, 1.65¢ @ 1.70¢; Tees, 1.90¢, and Z Bars, 1.80¢ @ 1.90¢.

Plates.—A fairly large tonnage is going, which is sufficient to keep the mills moderately well supplied. As announced elsewhere the Carbon Steel Company of this city have commenced to make some extensive improvements and additions, which when completed will give this concern a capacity for turning out about 350 tons of Open-Hearth Steel every 24 hours. No material change in prices has occurred since our last report and we quote as follows: Ordinary Fire Box at 2.25¢ @ 2.50¢; best Quality, 3¢ @ 3.25¢; Flange, 1.90¢ @ 2¢; Tank, 1.65¢ @ 1.70¢; Shell, 1.75¢ @ 1.80¢; Universal Plates, 1.70¢ @ 1.75¢.

Pipes and Tubes.—At a meeting of the Wrought Iron Pipe and Tube Manufacturers' Association held in the Fifth Avenue Hotel, New York City, on Thursday, 13th inst., prices and discounts were revised and went into effect on the above date. List prices on certain sizes of Black, Galvanized and Tarred Pipe have been changed as follows: Three-fourths inch Galvanized Pipe, 10¢ per foot; 1-inch Black, 11¢; 1-inch Galvanized, 14¢; 1-inch Tarred, 12½¢; 1½-inch Black, 14½¢; 1½-inch Galvanized 19¢; 1½-inch Tarred, 17¢; 3-inch Black, 84¢; 3-inch Galvanized, 70¢; 3-inch Tarred, 73¢; 3½-inch Black, 76¢; 3½-inch Galvanized, 90¢; 3½-inch Tarred, 91¢; 4-inch Black, 90¢; 4-inch Galvanized, \$1.05; 4-inch Tarred, \$1.10. Prices on other sizes not mentioned above remain unchanged. Extra and Double Extra heavy lists of above sizes were advanced in proportion. Discounts were also changed and are now as follows: Butt-Weld Black Pipe, 60 % discount from manufacturers' list; Butt-Weld Galvanized, 50 %; Lap-Weld Black, 67½ %; Lap-Weld Galvanized, 57½ %. The discounts on Extra Heavy, Double Extra Heavy and Tarred Pipe are the same. On Boiler Tubes discounts were agreed upon as follows: Two and three-fourths inch and smaller, 65 % discount from manufacturers' list; 3-inch and larger, 67½ %. Makers agreed to observe these prices and a determined effort will be made to uphold them. Within the past week the American Tube & Iron Company, with works at Youngstown, Ohio, and Middletown, Pa., have secured a contract from a natural gas company for 20 miles of 3-inch line pipe, and a contract from the People's Natural Gas Company for four miles of 8-inch line pipe.

Wire and Cut Nails.—The Wire Nail trade is considerably disturbed over reports to the effect that a large maker has not been observing the established price for some time, having made sales at prices equivalent to \$1.45 @ \$1.50, Pittsburgh. A meeting of the Wire Nail manufacturers is being held in Cleveland to-day, and in all probability this matter will be thoroughly discussed and definite action taken upon it. A slight falling off in inquiries for Wire Nails is reported, due principally to the fact that large buyers have covered their requirements for the season and are now out of the market. In Cut Nails the situation is only fairly satisfactory; considerable distrust exists on account of the action of certain manufacturers in shading the new card. It is claimed that contracts based on \$1.12½ are quite common, and it is further intimated that even this very low price has been shaded in large transactions.

Muck Bars.—There is no improvement in inquiry and Bars are held nominally at \$24.00 @ \$24 25, Pittsburgh, the first named being the ruling price.

Steel Rails.—The improved inquiry referred to last week continues and it is believed that within the next month or so considerable tonnage will develop. Prices are unchanged, the old quotations of \$29 at mill for standard sections still prevailing.

Connellsville Coke.—During March, Coke shipments from the Connellsville region, in the aggregate of cars and tons, were the largest in the history of the trade, with the exception of January, 1890, when the shipments amounted to 35,455 cars, or 623,229 tons. The shipments for March were 34,194 cars, or 641,876 tons, nearly 20,000 greater than January, 1890. It is believed that shipments for this month will fall below those of March. Prices are unchanged and we continue to quote Furnace Coke at \$1.60, with \$1.50 being named on desirable contracts. Foundry Coke is unchanged at \$2.15 to dealers and \$2.30 to consumers.

Wire.—Trade continues very satisfactory and mills continue employed up to their utmost capacity to turn out the various kinds of Wire as fast as wanted by the trade. Prices are firmly maintained, and we continue our quotations of 2.20¢ for Painted Barb Wire in carload lots, and 40¢ additional for Galvanized in same quantity. Plain Wire is in very heavy demand, and considerable complaint is heard from buyers owing to tardy shipments from mills. Prices are being firmly maintained on the following basis: Nos. 6 to 9, 1.70¢ in carload lots and 1.75¢ in less quantities; Nos. 10 and 11, 1.80¢ @ 2¢; No. 12, 1.90¢; No. 13, 2¢, and No. 14, 2.15¢.

Bars.—Leading makers, whose product has been on the market for years and is consequently well-known among buyers, are securing enough business to keep their establishments moderately busy. Other concerns, not so favorably situated, have considerable difficulty to get enough orders to keep them busy, and as a result when a good order is in the market there is a scramble for it and prices suffer. A month or two ago it looked as though prices would get better, and for a time a slight improvement did prevail, but just now prices seem to be as low as ever they were, with the outlook for improvement not promising. We quote Steel Bars at 1.50¢ @ 1.55¢, half extras, while some mills charge a slight advance on these prices for Refined Iron Bars. In the Mahoning Valley, Bars are held at 1.42½¢ @ 1.45¢, half extras, at mill.

Merchant Steel.—A few season contracts have been placed, but the large buyers, although looking around, have not as yet come to the point of placing con-

tracts. Prices are ruling about as given last week and we quote Spring and Machinery at 1.70¢ @ 1.75¢; Tire, 2¢, and Tool Steel from 5¢ upward, according to quality.

Wire Rods.—The demand is quiet, with the recent advance price to \$31, f.o.b. cars Pittsburgh, reported as being maintained. In view of the decline in price of Billets it is not improbable that buyers will expect a corresponding reduction in price of Rods.

Sheets.—The condition of trade is about as noted last week. A fairly large volume of business is going, consisting principally of small lots, with makers fairly well fixed with business for delivery up to July 1. In view of the uncertainties surrounding the settlement of the wage scale, some makers are asking a slight advance over present prices for deliveries of Sheets after July 1. We continue to quote Common Sheets as follows: No. 24, 2 45¢ @ 2 50¢; No. 26, 2 55¢ @ 2 60¢; No. 27, 2 65¢ @ 2 70¢. About 5¢ additional @ 100 lb is charged on above prices for Steel Sheets.

Skelp Iron.—The improved demand for Pipes and Tubes has toned up the Skelp market to some extent, and it is claimed that prices are slightly firmer. We continue to quote Grooved at 1.50¢ @ 1.52½¢, and Sheared at 1.70¢ @ 1.72½¢, with the usual terms.

(By Telegraph, April 19, 1 p.m.)

Pig Iron.—The market on Bessemer Pig during the past week was extremely quiet and very few transactions occurred. The advantages are undoubtedly with the buyers, and concessions are being asked, which shows conclusively that they are determined to benefit themselves as much as possible while they have the opportunity. While there is considerable pressure to sell Iron, much of it comes from speculators or brokers who have bought heavily and are anxious to realize. Should this pressure to unload continue, prices will undoubtedly go lower, and on the other hand if it is withdrawn, further declines may be prevented. However, at this time all indications point to lower prices for the next week or two. It is reported that furnaces in the Mahoning Valley have offered Iron at \$13, at furnace, equal to \$13.60, Pittsburgh, for May and June shipments. We quote as follows:

Neutral Gray Forge.....	13.25 @	cash.
All-Ore Mill.....	13.50 @	"
No. 1 Foundry.....	13.75 @	14.00 "
No. 2 Foundry.....	12.75 @	13.00 "
Charcoal Foundry No. 1.....	17.00 @	18.00 "
Charcoal Foundry No. 2.....	16.50 @	17.00 "
Bessemer Pig.....	13.60 @	13.75 "

We note a sale of 2500 tons of Bessemer, for May to June delivery, at a price equal to \$13.70, Pittsburgh, and a sale of 3000 tons, equal delivery in May and June, at \$13.65, Pittsburgh.

Billets.—The situation is much the same as noted last week, with the exception that prices are somewhat weaker. It is claimed that the steady decline in Billets for the past two or three weeks has been caused principally by the efforts of some prominent dealers to dispose of Steel, and who have been compelled to make material concessions in prices in order to effect sales. For this reason the decline cannot be said to be due to overproduction and falling off in consumption. Makers in Pittsburgh and Wheeling have very little Steel to sell, and

are not forcing the market at this time. A transaction involving 3000 tons of Rod Billets is reported as being closed last week at a price equal to about \$22.25, at maker's mill. The market to-day is holding at \$22.25 @ \$22.50 for Steel up to July 1. The Duquesne Mill went off on Saturday for repairs, which will require six weeks or two months to complete.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 19, 1893

Prices for Pig Iron warrants have receded somewhat, chiefly because of inaction among regular traders and extremely indifferent interest on the part of outside operators. Scotch are down to 40/8 and Cleveland to 34/1½, while Hematites are freely offered at 45/7½. Stocks in public stores are almost stationary, including 341,000 tons Scotch and 67,000 tons Cleveland Iron. Scotch shipping brands, in the face of rather poor demand, fairly hold their own, owing to comparatively light production.

Pig Tin for prompt delivery advanced early in the week to £94. 17/6, under the influence of somewhat stimulating advices from New York and reports of light shipments from the Straits, but subsequently receded 15/, owing to smallness of buying orders. Meanwhile futures not available for delivery in the United States before July were offered at a heavy reduction from spot prices, giving the market an unattractive appearance.

Copper has been dull during the week, in the face of more favorable statistical exhibit, and Merchant Bars for prompt delivery sold down to £44. 11/3. Buyers hesitate owing to rather weak advices from New York and delay of American mining officials about signing the agreement to extend limited output to the end of the year. Toward the close, however, there was more buying and a slight turn for the better in prices. European stocks have decreased 2098 tons during the first half of the month and the visible supply is smaller by 2387 tons. Chili charters were 500 tons. Owing to scarcity of Furnace Material, smelters are taking quite large quantities of Bars. Recent sales of Furnace Material include 700 tons Montana Argenterous Matte at 9/6 and 450 tons ditto at 9/3.

The Tin Plate market is practically unchanged. Business at the quarterly meetings was small, with the exception of a few good lines of Bessemer Cokes. There is still a liberal inquiry for Black Plate and prices for the same remain quite firm.

Scotch Pig Iron.—There is little change in character of business, and former prices prevail for nearly all brands:

No. 1 Coltness, f.o.b. Glasgow.....	53/
No. 1 Summerlee, " ".....	49/6
No. 1 Gartsherrie, " ".....	47/6
No. 1 Langloan, " ".....	55/
No. 1 Carnbroe, " ".....	43/6
No. 1 Shotts, " at Leith.....	52/9
No. 1 Glengarnock, " Ardrossan.....	48/6
No. 1 Dalmeilington, " ".....	46/
No. 1 Eglinton, " ".....	44/

Steamer freights, Glasgow to New York, 2 6; Liverpool to New York, 7 6.

Cleveland Pig.—Business is moderate, but makers hold quite firmly at 34/6, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—The market remains very quiet, and makers' prices are nominal at 47/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Dealings moderate, but sellers asking former prices. English 80 % quoted at £10. 15/, f.o.b. shipping port.

Steel Rails.—Inquiry is somewhat better but not sufficient to affect prices. Heavy sections quoted at £3. 15/, f.o.b. shipping port.

Steel Slabs.—Market very quiet and unchanged. Bessemer quoted at £4, f.o.b. at shipping point.

Steel Billets.—Moderate sales making at about former prices. Bessemer, 2½ x 2½ inches, quoted at £4. 2/6, f.o.b. shipping point.

Steel Blooms.—Demand continues very slow. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Old Iron Rails.—There is little doing, but holders ask former prices. Tees quoted at £2. 7/6 and Double Heads at £2. 7/6 @ £2. 10/, f.o.b.

Scrap Iron.—Only moderate business, but prices quiet and steady. Heavy Wrought Iron quoted at £2, f.o.b.

Crop Ends.—The market is quiet and unchanged. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—Dealings are of about the same character as for some time past and chiefly at old prices. We quote, f.o.b. Liverpool:

Staff. Ordinary Marked Bars	8 0 0 @	£ s. d.
" Common	6 5 0 @	£ s. d.
Staff. Bl'k Sheet, singles.....	7 7 6 @	£ 7 10 0
Welsh Bars (f.o.b. Wales).....	5 7 6 @	£ 5 10 0

Tin Plate.—There is a fairly good demand and prices remain steady. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	13/3 @	13/9
IC Bessemer Steel, Coke finish.....	12/0 @	12/3
IC Siemens " ".....	12/3 @	12/6
IC Coke, B. V. grade 14 x 20.....	12/0 @	12/3
Charcoal Terne, Dean grade.....	13/6 @	14/

Pig Tin.—Market steady at the close, but quiet. Straits quoted at £94. @ £94. 2/6 for spot and £88. 15/ for three months' futures.

Copper.—Market closes steady, with rather more business. Merchant Bars quoted at £44. 15/, spot, and £45. 2/6, three months' futures. Best selected, £49.

Lead.—The demand continues moderate, and prices are barely steady at £9. 12/6 for Soft Spanish.

Spelter.—Demand is slow, and prices are barely steady at £17. 10/ for ordinary Silesian.

Professor Ewing of London says that the whole ground in the neighborhood of the City & South London Electric Railway is practically charged with electricity; and Mr. Preece, electrician to the post office, states that the railway causes disturbance to the post office telegraph instruments all over London and even as far as 130 miles from London. Under these circumstances, says an English exchange, it is obvious that the earth must not be used as the return conductor, and that all electrical systems for these powerful currents must have complete metallic circuits. Failing this, we may one day have a very curious, not to say alarming, state of things.

HARDWARE.

Condition of Trade.

WITH THE ADVANCE in the season a still further increase in the volume of business is noticeable, and trade may in a general way be referred to as in a very satisfactory condition. In some lines, however, there is complaint on the part of the manufacturers that the season's demand has not yet set in in full volume, the severe weather which has until recently prevailed having the effect of keeping back trade somewhat. Seasonable goods are especially active. Wire Cloth, Lawn Mowers, Freezers, Barb Wire, Steel Goods, &c., are moving very freely. The tone of the market does not show any important modification. Prices on the whole are quite well maintained, with slight advances in some lines. There is a good deal of complaint in regard to collections, which are sluggish and unsatisfactory in several parts of the country.

Chicago.

(By Telegraph.)

The volume of business in Shelf Hardware is of a satisfactory character and is now up to about that which is usually expected in April. The improvement which has taken place this month is in marked contrast with the comparative sluggishness of the first quarter of the year, when sales ran below the average for that season. The demand now is unusually heavy for Wire Cloth, Poultry Netting, Wire Screens, Screen Doors, Garden Tools and summer goods generally. Roofing Plates are moving much more freely with the advance of the building season. Bright Tin Plates are also in much demand. No special change in prices has occurred since our last report. Heavy hardware is in very good demand, all houses here reporting an excellent condition of business. The carriage-makers' strike is losing its force and is not felt to any considerable extent.

There is no scarcity of Poultry Netting in this market. One or two manufacturers may have oversold, and those having contracts with them may suffer a little inconvenience in securing stock from other manufacturers, but such ample preparations have been made by the latter to meet such a contingency that assurances are given the trade that a plentiful supply will be available. This statement is made to counteract the impression that there is a shortage and that prices may be materially advanced.

St. Louis.

(By Telegraph.)

Hardware jobbers continue to report a heavy trade in nearly all lines of goods. There is an unprecedented demand for Wire Cloth, and complaint is heard from other centers regarding the scarcity of

this commodity. We learn that \$1.45 was offered and refused for 1000 rolls in Chicago last week, and advices from that point indicate very light stock. Locally stocks of Wire Cloth are in excellent shape, and jobbers are filling orders promptly at \$1.50. An improved trade in Barb Wire and Wire Nails is noticeable, without, however, any change in prices. A heavy trade is doing in Carriage Bolts, Carriage Springs and Galvanized Iron. The Bicycle trade continues to show rapid improvement, and promises to be extremely heavy.

Cleveland.

THE W. BINGHAM CO.—April starts out in good shape, traveling salesmen sending in a goodly number of orders. The demand for some goods—such as Wire Cloth, Poultry Netting, &c.—exceeds the supply, the early demand being much larger than heretofore and manufacturers seeming to be poorly prepared to meet it. A portion of the increase may be due to the fact that as April has started out with such pleasant weather, dealers are needing the goods sooner than usual. Wire Nails are held firm at \$1.60 rates and the advance in Plain and Barbed Wire is being firmly maintained here. Locally, there is a large amount of building coming on, which will require a large quantity of medium and first class house trimmings. The Bicycle trade is daily increasing. The volume of business in all branches is quite satisfactory.

Louisville.

W. B. BELKNAP & CO.—The large business continues, despite the gold exports from New York. Prices are low in most things, unless it be Wire and Wire products, and certain goods are by no means easy to get. Orders for speedy execution, while sought after and entered cheerfully, are not filled completely or satisfactorily. The circumstances over which the manufacturer has no control, seem to be on the increase, and anything like the old time execution of orders from a factory or mill stock is apparently out of the question. One has simply to wait till the sizes can be easiest made in due process of manufacture. It is claimed that margins are so meager that no special effort or labor can be expended.

Wire, both Plain and Barbed, continues to be scarce and in immense demand.

We have had a beautiful stretch of warm, spring weather, but there is time between this and the first of May for a deadly frost to get in its work and give the farmer a chance to draw upon our sympathies over his blighted fruit.

Baltimore.

CARLIN & FULTON.—During the last two weeks business has continued good and at no time this year have we seen more buyers in our city.

There has been a remarkable demand for all the productions of wire, and the

increase in the variety of such products of late years has been wonderful. The fertile brain of the inventor seems now to delight in adding to the already numerous styles of fence, and every additional design embraces of course some wonderful property possessed by none other.

The demand for grain cradles from the cotton States indicates a fair acreage in wheat, but we regret that the largely increased sales of fertilizers, especially in the State of Georgia, demonstrate the possibility of the repetition of the errors of former years in devoting too great an area to the cultivation of cotton and its consequent overproduction.

Just at present, we hear from all sections the complaints of poor collections and tight money, and we are compelled to grant accommodations in many cases where such favors have never been asked before. There is little at present for the agriculturist to realize money upon, but in a little while the shipments of early vegetables and fruits from the South will begin and the watermelon, the tomato, the potato and the green pea will be drawing from the colder North their equivalent in, hardly gold, but most certainly silver.

It is a problem as to what effect the World's Fair will have upon the general trade throughout the country, and in some respects we think very probably the result will be anything but beneficial. Those who have been accustomed to spending a certain amount of money every summer in either rest or travel can substitute a trip to Chicago for a visit to either the seashore or the mountains, without having any different effect than has always been produced in the locality called home, but we fear in very many cases the money which is needed for the ordinary living expenses of the family, and which would go into circulation in the community in which it is situated, will be spent in an excursion which, though most tempting, is still to many a most costly luxury and which cannot be afforded.

We have few changes in prices to note, as the active demand for goods which are strictly seasonable has enabled the manufacturers to sustain their prices well, while on other lines costs have already been so low that there has been little opportunity or desire to stimulate business by any further reductions.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—Trade so far in 1893 is considerably behind that of 1892. This is partly owing to the late spring, and partly to the stringency in the money market. Not for years have we had so backward a spring; trees and vegetation are about where winter left them. The prospects for crops are excellent, both for grain and fruit. We miss the immigration that poured into this country three years ago, and while there are many coming now the territory is so large that their coming is hardly felt.

The lumber industry is still depressed, and prices realized far from satisfactory. This works a hardship on the Hardware business, as it curtails sales in all lumbering tools. Prices show little or no change.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—During the interval since our last report Philadelphia as far as the Hardware jobbing trade is concerned, seems to have been well favored with business, and the exception has been when night work has not been a case of necessity to keep orders moving through promptly and shipments made on time.

From all reports the lines being sold seem to be well assorted, while the heaviest shipments of Agricultural Tools and Farming Implements of all descriptions have been made, there is still an excellent demand for these goods.

Poultry Netting seems to be receiving a full share of attention, the retail trade evidently recalling the vexatious delays in shipments during the spring of 1892, and are anticipating their orders more than in previous years by specifying for both earlier shipments and quantities nearer their actual requirements.

There is one item that we feel is going to cause considerable trouble this spring, as far as the ability of manufacturers to supply the demand goes. We refer to Screen Wire Cloth, as one of the largest, if not the largest mill in the country, with a capacity of about 15,000,000 square feet, has not been in operation for some time, which, with the fact that the demand of manufacturers for made-up Screens has been in excess of what it has been in former years, has already caused a shortage and all hands are this early clamoring for shipment of their goods.

Some of the mills, while not only positively refusing new business, are also causing considerable complaints from those whose orders they have had several months past. Inasmuch as cut Cloth has not commenced to be used as yet, we fear that later on there will be considerable trouble and annoyance caused to the retail trade.

Wire Nails seem to be in good demand notwithstanding the advanced price at which these goods are held.

From all reports none of the mills are in a position to make shipments earlier than from two to three weeks, while if the reports be true, some of the mills are supplied with orders that will take six weeks or over to complete.

Lawn Mowers are in excellent demand, and the promises are for an increased sale far beyond that of previous seasons.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—There is but little that is new to report at this date. Spring weather started in very favorably at the first of the month, but a week of fine spring days was followed by a spell of frost and snow, with heavy general rains intermixed. The trade, as well as everything else, has felt the influence. A few days of mild weather affected business perceptibly in all channels, and the same effects will doubtless show in the days of sunshine that are in store for us in the near future.

Fairly moderate trade is expected in the coming fortnight, with the probability of an increased trade for May. Prices of some staple goods are a little weaker, though the actual decline is small. There has been an active market for Nails, but the price is low, with no prospect of an advance.

The great trouble with the trade in the Northwest, as doubtless generally is the case, is the disposition of some houses to sell, even without profit. Their motto, written out in large characters over their whole business, seems to be to "swell sales at the expense of everything else." Like the poor, "we always have them with us."

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—Another two weeks have rolled around and still there is no appreciable change in trade conditions of Omaha, or the territory tributary, for that matter. As we have noted for some time past the movement of all kinds of Hardware from this point has been very heavy and eminently satisfactory to the jobbing fraternity. In some sections bad roads are undoubtedly the cause of light business transactions, still on the whole the general volume of business is well up to the average, if not in excess. It is about the same old situation that is presented every spring and will be until the people of the West are sufficiently aroused to introduce some effective method of improving the roads of the country. With good roads the farmers would be going to market during the bad spring weather when they cannot work in the fields, but under the present road system, when it is too wet to work in the fields it is also too wet to venture on the roads.

The change to warm and spring-like weather will have a tendency to stimulate the demand for spring and summer goods, and will, no doubt, assist business very materially in certain lines.

Money is fairly easy, as farm products have been bringing good prices, and there is still lots of stuff continually being marketed for cash at profitable figures.

New Orleans.

A. BALDWIN & Co.—Business still continues fairly active. There is no extra heavy demand in any special line. Wire and Nails are not moving so freely, but in all other lines we report an improvement.

Notes on Prices.

Cut Nails.—There is a large demand for Cut Nails and the volume of business is entirely satisfactory. Prices are also fairly well maintained on the basis of \$1.20 for carload lots at mill. A concession of 2½¢ to 5¢ is however made somewhat more freely than a week or two ago. New York quotations are \$1.40 for small lots from store.

Chicago, by Telegraph.—An increasing proportion of Cut Steel Nails is now being sold as the gap widens between Cut and Wire Nails, but Wheeling manufacturers are making themselves felt to a greater extent in this territory and prices are not so firm as they have been. Open quotations on factory lots are still \$1.35 Chicago.

Jobbers have slightly reduced their prices and now name \$1.45 from store for small lots.

Wire Nails.—The market is firm at the same prices which ruled last week—namely, \$1.55 f.o.b., mill, with Cleveland as the point of equalization for the West and Pittsburgh for the East. The demand from the large houses is not as heavy as before the late advance, their requirements for the near future having been pretty well covered, but the volume of business at present prices is large and the trade would not be surprised if another advance were determined upon. There is some disposition on the part of jobbing houses to undersell the manufacturers, as many of them are enabled to do this on account of having purchased large stocks at former prices. Small lots from store in New York are quoted at \$1.80 to \$1.85.

Chicago, by Telegraph.—The demand for Wire Nails is exceedingly good from consumers of Nails, but jobbers are well supplied with stocks and are not doing much in placing new orders with factories. A peculiar feature of the recent trade is the very high average of orders caused by the great demand for fine Nails. Manufacturers' prices have been firmly maintained at \$1.55 Cleveland, but it is possible that the meeting of the manufacturers at Cleveland may have slightly advanced this rate. Such action is expected by the trade. Small lots are selling from stock at \$1.75.

Barb Wire.—A very heavy business is in progress, and prices are steadily maintained; \$2.45 for Four-Point Galvanized in carload lots at mill is firmly adhered to, and in some cases \$2.50 is asked. While the tone of the market is excellent there does not appear to be a disposition on the part of manufacturers to ask higher prices, as those now ruling are referred to as remunerative, and it is regarded as good policy not to encourage competition or cutting by unnecessarily high quotations. Small lots delivered in New York are quoted at \$2.70 for Galvanized and \$2.30 for Plain.

Chicago, by Telegraph.—Manufacturers report that second orders are not coming in so well as they would like to see them, but heavy shipments are still being made on old contracts and prices are firm. The trade of this season is by no means as large as it was a year ago, but makers look forward to a better business later, arguing that it is simply postponed and will make itself felt in due time. Plain Wire is in heavy demand with consumers frequently telegraphing their orders to hurry shipments. Quotations are unchanged on factory lots at \$2.20 for Painted and \$2.60 for Galvanized. Jobbers report the Barb Wire trade running rather light for the season, and, therefore, a disappointment. They quote small lots at \$2.30 and \$2.70 respectively.

Shears.—The leading makers of Steel Shears have just perfected an organization to be known as the American Shear Manufacturers' Association. The officers are as follows: F. C. J. Wiss of J. Wiss & Sons,

president; J. H. Clauss of the Clauss Shear Company, vice-president, and Henry T. Seymour of the Henry Seymour Cutlery Company, secretary and treasurer. The object of the association is to secure concerted action to prevent the excessive cutting in price which has characterized the market in this line for some time, and to establish more uniform prices which will yield the manufacturers a profit on the goods. A number of the principal manufacturers have already identified themselves with this movement, and it is expected that it will include others so that this line will be in a more satisfactory condition than has recently characterized it.

There has also been formed an association to regulate the price of Cast-Iron Shears, which includes the leading manufacturers of this class of goods. The price on these goods has been in a demoralized state for some time, but the market in this line has now a better tone.

Rope.—As a result of the condition of things referred to in our last report a reduction of $\frac{1}{2}$ cent per pound has been made in Manila, and the base prices for Cordage are now as follows:

	Per Pound. Cents.
Manila.....	8 $\frac{3}{4}$
Sisal.....	7 $\frac{1}{2}$ to 7 $\frac{3}{4}$
New Zealand.....	6 $\frac{3}{4}$ to 7

These prices, it will be observed, are exceptionally low and are regarded by many large houses as affording an excellent opportunity for the advantageous placing of orders, as it is not unlikely that a reaction will occur before long.

Galvanized Pump Chain.—In accordance with the understanding reached by the associated manufacturers of Galvanized Pump Chain, the following prices are regularly maintained, terms f.o.b., factory:

	Per 100 pounds.
5 ton lots	\$5.50
1-ton lots.....	5.75
500-pound lots.....	6.75
Less than 500 pounds.....	7.00

Bicycle Lock.—This Lock, which is described in another column, is put on the market by the Smith & Egge Mfg. Company, Bridgeport, Conn. The goods are sold from the following list, which in less than gross lots is subject to a discount of 50 per cent.:

No.	Per gross.
12, Corrugated Brass Shell, Nickeled.....	\$60.00
32, Figured Brass Shell, Nickeled.....	75.00

The Matador Meat Slicer.—This article was described in our last issue and is manufactured by the Gwinner Mfg. Company, Hamilton, Ohio. It is sold to the trade at \$9 each, subject to a discount of 40 per cent.

Needle-Point Saws.—The following is the price-list of the Needle Point Saws put on the market by the S. A. Haines Company, Indianapolis, Ind. It is subject to a discount of 40 per cent.:

Needle-Point Hand-Saws.		
26,	28,	30 Inch,
\$36.00	42.00	48.00 per dozen.
Per dozen.		
No. 16 Needle-Point Wood Saw Blades..	\$8.00	
No. 516 Wood saw, No. 8 Blade, Frame		
Red, List.....	12.50	

Needle-Point One-Man Cross Cut Saw.							
3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6 feet.	
\$2.56	2.76	3.24	3.70	4.16	4.63	5.06	
Needle-Point Cross-Cut Saw.							
4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$ 8 feet.
\$3.20	3.60	4.00	4.40	4.80	5.20	5.60	6.00 6.40

The Columbia Fly Fan.—Matthai, Ingram & Co., Baltimore, Md., who are manufacturing the Columbia Fly Fan described in our last issue are quoting the goods to the trade at \$20 per dozen, with 10 per cent. discount in lots of less than one dozen, and 20 per cent. discount if ordered in full case lots of one dozen or more.

Family Grist Mills.—A description of these mills as manufactured by the Rogers Iron Company, Springfield, Ohio, appeared in our last issue. The list price on the No. 1 Mill, which weighs 27 pounds, is \$5, and that of the No. 3 Mill, with Wrought Iron Legs, weight 44 pounds, \$7. These prices are subject to a discount of 40 per cent. to the trade.

Glass.—The conferences of the National Window Glass Company in the East, to which we referred last week, have resulted in several important accessions to membership in the association, among which are included New Jersey Glass manufacturers, while New York jobbers of American Glass who are not already members of the National Company, are considering the matter favorably. The New York Importers' Window Glass Association have the matter of working in harmony with the National Company under advisement, though no definite course has been decided upon. The New York and Boston importers have arranged, however, for uniform prices. These consolidations tend to strengthen the Glass market, and to put it in a better condition than for some time past. At a meeting of the National Window Glass Company, held in Chicago April 11 and 12, a change in prices was made to apply only to territory west of the Alleghenies, going into effect April 17, as follows: Carloads of not less than 24,000 pounds, specifications to be sent within two weeks of order, for shipment in one lot to one purchaser, within 30 days thereafter, a discount of 80 and 10 and 2 $\frac{1}{2}$ per cent. One hundred boxes or over, but less than a carload, in one lot to a single purchaser, discount 80 and 7 $\frac{1}{2}$ per cent. Less quantities than 100 boxes, discount 80 and 5 per cent. The National Plate Glass Company, whose incorporation was noticed in our Glass review of last week, have not yet announced their plans, but it is reported that possibly all the plants in the country may be purchased by the National Plate Glass Company, which will issue stock in return. We are advised that the restriction put upon the output of the Plate-Glass plants in this country, and the consequent restricted amount that is allowed each dealer, is stimulating the importation of certain grades of Glass, for which importers have never had inquiries. Among these are Plate Glazing Glass and Glass for cheap mirrors. We understand that when an American Plate-Glass plant has produced its allotted amount

of Glass it is shut down. Quotations in all lines are well maintained as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17 $\frac{1}{2}$ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7 $\frac{1}{2}$ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

The American Wash-Board Company.

THE AMERICAN WASH-BOARD COMPANY, 1747 East Madison avenue, Cleveland, Ohio, for whom John G. Rollins, 15-25 Whitehall street, New York, is sales agent for export trade, have recently purchased of Gorham & Sargent, Cleveland, Ohio, the Lapham-Dodge Company, Cleveland, Ohio, and Fuller Brothers Mfg. Company, Kalamazoo, Mich., their plants and entire interests in the Wash-Board business, and will operate the same in the name of this company, with headquarters at 1747 East Madison avenue, Cleveland, Ohio.

The business will be under the management of J. M. Gorham, president and treasurer; J. T. Sargent, secretary and general manager; Chas. D. Fuller, superintendent of manufacture, who will aim to give patrons a much better and more uniform grade of Wash-Boards than was furnished by the above named companies, while operating independently of each other.

It is stated that this is not a combine or a trust, but a straight out and out purchase of the companies named.

In consolidating these companies the American Wash-Board Company believe that they have made a move in the right direction to serve the best interests of the wholesale trade in general, as well as their own.

The point is made that it will enable the buyers to purchase nearly all of the leading Wash-Boards of the country of one company, and make up car loads much easier than heretofore, thus securing to them the advantage of car load rebates.

The company remark that it will not be their policy to make a general advance in prices, but to drop from their list a number of the lower grades of Wash-Boards, which are a loss to the manufacturer and dear to the consumer, and furnish those of the better class under the regular brands and at the present established prices.

NICHOLS BROTHERS, manufacturers of Butcher Knives, Cleavers and Steels, &c., Greenfield, Mass., advise us that they have one of the best plants in the country for the economical production of their goods. To accommodate the demands made by their increasing business, they removed some months ago from Barnardston, where they were formerly located.

Cutlery Exhibit of J. A. Henckel.

J. A. HENCKEL, Solingen, Germany, for whom Graef & Schmidt, 29 Warren street, New York, are American representatives, has arranged an elaborate and valuable exhibit of Cutlery for the World's Exposition, some features of which are noticed herewith.

Among the show pieces of the exhibit is a pair of Shears which are probably the largest ever manufactured anywhere in the world, being about $5\frac{1}{2}$ feet long. The steel out of which the blades were forged weighed 128 pounds; the finished blades weigh 72 pounds, and the whole Shear with handle weighs about 80 pounds. The handles of the Shears are made of gold bronze, richly ornamented, showing at the intersection the trade-mark of the firm. This trade-mark has



been in the possession of the Henckels family since the year 1731. These Shears can be practically used, as they cut as well as any other Shear made, even cutting the finest tissue paper. Like everything else connected with this World's Columbian Exhibition turns around America, so these Shears turn around America, as the word America is etched on the large screw holding the scissors together, the screw being about $2\frac{1}{4}$ inches in diameter.

Besides these Shears there are in the exhibit two large Pocket Knives, each measuring when closed about 20 inches and when open about 48 inches. Each Knife weighs 36 pounds. They contain a whole arsenal of blades, scissors, Henckel's patent knife shears, pruning shears, corkscrews, files, saws, yard measure, &c. The scales of one of these Show Knives are made of ivory, beautifully carved, showing in the center a globe with the New World, and to the right and left the figures of the years 1492 and 1893. The scales of the other Knife are made of ebony, inlaid with ivory.

Another feature of the exhibit is a large Show Razor, the blade as well as the handle of which are real works of art. The blade, which is 30 inches long and 6 inches wide, is finely etched, giving a true picture of the different buildings comprising the Henckels' factory. The center of the large ivory scales shows the head of Columbus, artistically carved, flanked on each side by an angel, while in the back of it is seen one of the caravels of the discoverer. Emblems of navigation and commerce complete the picture.

Several enormous Carving Knives and Forks are also noticed, one pair especially, the handles of which are made of staghorn of exceptionally rare beauty.

Some large Hunting Knives, Daggers and Swords, the blades of which are $28\frac{1}{4}$ inches long and 3 to 5 inches wide, form another interesting part of this fine exhibit.

Besides the beautiful ivory and bronze handles the strikingly fine Damascene blades of these Daggers and Swords will

attract attention. These blades show different styles of damask, several styles of rose damask, and also Turkish damask. The Turkish damask consists of 32 parts of different kinds of metal, the guard on one of these Swords consisting even of 46 different parts of metal. Such damask steel, it is stated, is not made any where outside of Solingen.

The art of making these Damascene blades is very difficult. Years ago some of the workmen of Solingen learned the secret of this art from the Arabs of Toledo, Spain, and brought it back to their native city. They acquired such a perfection in this art, even surpassing the best products of the Sword makers of Damascus, that the Swords of Solingen became known as the best in the world. This secret is now only known to a few old families of Solingen, and is very jealously guarded.

Besides the articles mentioned there are other large show pieces, such as Corkscrews, Cook Knives, Butcher Knives, &c. The showcases for Henckel's exhibit were all designed and built in Berlin by Julius Wendler, architect, who has come over expressly from Germany to put them up in Chicago, bringing also one of his workmen, a carpenter, with him.

Trade Items.

THE DISSOLUTION of the Sumner Hardware & Implement Company, Sumner, Iowa, is announced, Joseph Copeland and I. L. Hazen comprizing the firm taking this action by mutual consent. The Hardware department will be continued by Mr. Hazen, and the Implement department by Mr. Copeland, each branch being separate and distinct from the other, and neither party responsible for any debts contracted by any one in the name of the Sumner Hardware & Implement Company from the date of dissolution.

C. F. WIELAND has recently accepted the position as manager of the Bignall & Keeler Mfg. Company, St. Louis. Mr. Wieland is well known throughout the East, through his connection with Riter & Conley, with whom he was associated for a number of years.

AT A MEETING of the stockholders of the Paige Bros. Company, Akron, Ohio, held on the 8th inst., the name of the corporation by unanimous consent was changed to the Standard Hardware Company. The officers of the company remain as formerly, as follows: Theodore Butler, president and general manager; J. Ed. Good, vice-president and secretary, and W. B. Dodge, treasurer.

WELLS BROS. & Co., Greenfield, Mass., manufacturers of tools and machinery, are distributing a handsome Russia leather pocket case for bank bills which will be sent free to members of the trade who will write for it.

SCHMACHTENBERG BROS., who for some time have been located at 8 Warren street, New York, have recently taken a larger loft at 98 Chambers, where they could suitably display their samples and carry a larger stock of goods. This was made imperative, we are told, by the increase in their business. Their goods are made at Solingen, Germany, and consist of Pocket Knives, Razors, Scissors, Scissor Cases and Surgical Instruments.

THE RECENT DEATH of W. O. JACOBS of the Hardware firm of W. O. Jacobs & Co., Danielsonville, Conn., will involve no change in the firm style for the present. W. E. Lindell, who has been the confidential clerk of the firm for several years, will manage the store. An increase of business is reported with the coming of

spring weather, the attractive arrangement of the new establishment being also something of an enticement to people to come in and inspect it, resulting in some instances in sales.

KELLEY & WOOLWORTH, Buffalo, N. Y., in their advertisement in this issue illustrate Kelley's patent Dog Collar, which they are manufacturing in connection with other goods, including Dog Leads and Key Chains, Halter Chains, &c.

GEO. W. PECK & Co. have recently opened a new Hardware store at Bradford, N. Y., which is in charge of Daniel Albright. It is 60 x 25 feet, two stories and basement. This is the only store in the town in which a full stock of Hardware is kept, in fact the only one within a radius of several miles, and the indications are favorable for a large business. This is one of five stores carried on by Peck & Co. at different points.

C. H. CONOVER, secretary of Hibbard, Spencer, Bartlett & Co., of Chicago, started for the Pacific Coast on the 15th inst., where he will join his family, who have been spending some time in Southern California. He will be absent for about a month, enjoying a well-earned vacation from his arduous duties.

Direct Steamship Communication to South Africa.

NORTON & SON, 90 Wallstreet, New York, have been made the agents in this country for a new line of steamers about to be put on between New York and South African ports, which will include Cape Town, Algoa Bay (Port Elizabeth), East London and Natal (Durban), calling at Mossel Bay, Delagoa Bay, Mauritius and other places, if sufficient inducements offer. This line will be known as The American and African Steamship Line. The steamers are said to be of the first class, expressly adapted for the service and intended to cross the bars at East London and Natal. It is announced that the steamers will sail the 25th of each month, full or not full. The service will be inaugurated by the steamer "Worcester," 4600 tons, which will be ready to receive cargo May 10, closing date May 25; to be followed by the "Warwick Castle," June 25; "Afrikaner," July 25; "Mashona," August 25; and "Dunbar Castle," September 25. The other steamers of the line are the "Conway Castle," "Methven Castle," "Zulu" and "Basuto," all of 4500 tons, with two exceptions, those being 4200 tons. This is an old English enterprise, now running steamers from England to the Cape. The London agents are Bucknall Brothers, 23 Leadenhall street, E.C., the agencies in the colonies being under the management of Donald Currie & Co. The loading berth will be at the Empire Stores in Brooklyn. The rates, while not yet definitely fixed, will not exceed much, if any, sail rates, while quick transportation, better protection to goods, &c., are expected to stimulate trade. The insurance rate for sail goods to East London is now about $3\frac{1}{2}$ per cent. Norton & Son will effect insurance by steamer to this port for $1\frac{1}{2}$ per cent. While the same proportion will not hold to the other ports, there will still be a great reduction.

THE PECK, STOW & WILCOX Co., recently received an order for upward of a thousand mills for grinding coffee to be shipped abroad.

Export Notes.

MONSIEUR BELLET has informed the Paris Geographical Society that the Chinese have abandoned their crude and antique roofing materials, substituting sheet iron galvanized. In support of this statement he states that importations of galvanized-iron sheets at Shanghai, China, increased from 5,085 piculs (each equivalent to 133½ pounds) in 1890 to 12,913 piculs in 1891.

An Agricultural Implement house in Beekman street of this city is in receipt of an order and accompanying draft from a Siamese merchant for an American Grain Drill, its ultimate destination being not far from Bangkok.

Th. Pilter, Paris, France, the well-known dealer in Agricultural Implements, will import from S. L. Allen & Co., Philadelphia, 5,000 to 6,000 Harrows this season.

A consignment of 12 carloads of Oliver Chilled Plows going to France was noticed on a dock the other day.

D. M. Osborne & Co. of Auburn, N. Y., are shipping from five to six carloads of Harvesters, Binders, Hay Rakes, &c., to Harrold, Colton & Co., Adelaide, South Australia.

The Johnston Harvester Company, Batavia, N. Y., are shipping to Antwerp, to order, a large quantity of Reapers, &c., which, it is thought, has averaged five carloads a week for three or four weeks.

We notice a shipment of 27 carloads of Agricultural Machinery by the Walter A. Wood Mowing & Reaping Machine Company, by the steamer "Norge" recently, for Swedish ports.

The firm of Theile & Quack, exporters, of Bridge street, New York, have added to their office force E. Tilmas, who arrived from Hamburg on the "Augusta Victoria," April 15. He will assume charge of the shipping department. At first thought many will think this is a long way to go to fill such a position, but our foreign friends have spent many years in studying the export trade and realize the extreme care absolutely necessary in every department to foster and increase this class of business. This gentleman has been educated with a view to occupying such a position, and understands the intricacies connected with it, and writes German, French, Spanish and Portuguese.

How much many well intentioned business men fail to realize the necessity of following instructions from export buyers may be seen from the following letter concerning an article ordered in satisfactory quantities, with much larger orders in their possession to follow immediately, the terms being prompt cash on receipt of invoice.

We mark all our export orders with a diamond, and our shippers are too busy to bother with anything special. If our methods are not satisfactory we will cancel your orders.

The house ordering the goods requested that the cases be marked with a triangle

and a few figures inside instead of a diamond-shape figure. Then the goods could be handled from the dock instead of being carted to a warehouse for alteration of marks. If American manufacturers care to increase their trade it is imperatively necessary that instructions should be strictly adhered to, as exporters have not the time to write long letters explaining what often seems to the novice useless, but which in reality has been acquired by years of experience.

H. M. A. Haase of Haase & Vaughan, 140 Pearl street, New York, who has been in South Africa for several months, having left here November 12, 1892, has returned to Germany. This concern are the agents in this country for the Mercantile Corporation of the United States and South Africa, a Cape Town venture organized last year to do business between the two countries. On receipt of a cable from Mr. Haase, the junior member of the firm went to Hamburg, March 21, for consultation, arriving back April 13. It has been found that the management in Cape Town has misrepresented matters, and the result is that business on the original basis has been discontinued. The agents here say they have all the capital back of them needed, and in future will act independently of the foreign management if it is decided to go on with the enterprise. Consignors will be protected in shipments already made, and on the arrival of Mr. Haase here, which it is thought will occur in a few days, the business will be put on a different footing.

Patent Pirates.

COMPLAINTS have repeatedly been made that the Government grants patents, but if the ideas are appropriated by others than the inventor and goods manufactured by them, similar to those of the inventor, the patent office offers no protection to the inventor, nor does it in any way protect its own decision. The fact is that the patent office offers no protection further than allowing a patent on the invention. A person applying for a patent has ample means of learning this, and of knowing that in case of infringement the courts are open to him to obtain redress. It would appear that if the patent office should protect the inventor in case of infringement, instead of obliging him to carry the matter into the courts, much expensive litigation would be saved. That the patent office does not do this, does not lessen the feeling of contempt for patent pirates, who are endeavoring to become rich by the discoveries of other people. This matter is thus referred to by a leading journal:

A business man in this city who is up to his ears in the work necessary to gather capital to float an enterprise, and at the same time to keep information of the nature of it away from busy rivals, found time last week to say: "Did you ever think that a patent does not patent in this country? Well, it's a fact. All that the patent office does is to give you a paper with some writing on it; but if another man steals your idea and goes to manufacturing your invention, the patent office will not lift a finger to protect you or to stand by its own decision. The fact that you've got a patent is a point in your favor, but you've got to hire lawyers to fight the thief in the courts, and if he can stand it to hire lawyers longer than you can, that settles you, and you might as well make him a present of your invention. There are lots of men in the country who are getting rich on the discoveries of other people. All they had to do was to take 'em and fight the real discoverers into poverty. The patent office, to be respected, and to be of any use, ought to have the power to cause the stealer of a patent to be sent to prison."

What Retailers Say in Regard to Sales to Their Customers by Manufacturers and Jobbers.

THE ARTICLES which we have published in regard to the manner in which manufacturers and jobbers encroach upon the legitimate trade of retail merchants have attracted a good deal of attention and called out many responses from the trade. Some of the prominent jobbing houses express their gratification that the matter has been taken up by members of the retail trade, and allude to the question thus brought up as rapidly becoming a very serious one, not only to retail Hardware merchants, but also to jobbers. They specify cases in which manufacturers in certain lines sell to jobbers at fixed prices, and bind them by agreement to sell at other fixed prices to their customers. It is stated that then the manufacturers accept orders from large grange supply houses and sell to them at a rate which enables them to retail the goods at relatively low figures.

In the letters which are given below it will be observed that our correspondents refer to the condition of things as seen from their standpoint. It will be seen that reference is made to the fact that the trouble in question is not confined to the manufacturers, but that in some cases jobbing houses are referred to as dealing with consumers in a way that is troublesome to the retail merchants. The whole question is one of very considerable interest and apparently of growing importance as there appears to be an increasing tendency in the direction of transactions between consumers and both manufacturers and jobbers. We invite a thorough discussion of the question in its different aspects, and shall be glad to hear from any of our readers in regard to the matter. The letters printed below are written from the retailer's point of view. There is obviously something to be said also in regard to the interests of jobbers and manufacturers in the matter. In the letters we omit the names of our correspondents and indicate simply the State in which they are located:

ILLINOIS.—We have trouble with the jobbers in the West, especially with the Gun, Ammunition and Binding Twine trade, and this has gone to such an extent that the Gun trade is nearly ruined. We have had no difficulty so far with manufacturers.

GEORGIA.—We are annoyed and lose considerable trade by both manufacturers and jobbers selling direct to consumers, especially the jobbers, and this practice we are sorry to say is on the increase.

ALABAMA.—We have felt some inconvenience from this practice. Both job-

bers and manufacturers put men in our territory and sell to the trade that by right belongs to us. We trust you may be successful in overcoming this practice to a certain extent if not entirely.

ILLINOIS.—We lose some trade by jobbers and manufacturers pricing and selling to our best contractors. The most of our trouble is with jobbers from the small cities like Peoria, Quincy and Burlington. We are continually having their prices quoted to us by contractors and it seems to be growing every year. These small jobbers claim that they should have some of the trade and if they cannot get it through the merchant they must go to the contractor or consumer. The contractor will go to these jobbers and buy a bill and pay spot cash for it and then ask us to duplicate it and wait for payment until the job is done, or from three to six months.

ALABAMA.—We are troubled to some extent with jobbers, some of the smaller of whom visit our blacksmiths and a few of the factories.

ARKANSAS.—There is a great amount of business that is done direct with the jobber, and the worst feature of the matter is that their trade is of course all cash, while all of the time trading is done with the home dealer. We do not patronize a jobber who sells direct, if we know it, and think all other business men should do the same.

ILLINOIS.—There is a tendency in the direction of manufacturers and jobbers selling to consumers in their territory, both from Chicago and St. Louis, but the retail dealer appears to have no redress in the matter.

ARKANSAS.—We are annoyed considerably by jobbers selling in our territory to consumers.

INDIANA.—With some of our customers manufacturers and jobbers are our worst competitors. The jobbers in our neighboring city will solicit our trade at a named price and then turn around and sell to our customers at the same price. We have some customers that from three to five years ago we sold, say, from \$50 to \$150 worth of goods a month, who today buy only \$10 to \$20 worth of goods a month. It is a question with the retailers here as to what will be the outcome of it all unless we retire from the field and leave it to the jobber. We think that this tendency to deal with consumers is growing and will soon have to be met by some means, for we do not think the consumer can do without the retailer.

CONNECTICUT.—We see a growing tendency on the part of both manufacturer and jobbers of going to the consuming trade in our vicinity, and we are sorry to see some of the large manufacturers of New Britain coming here and selling, if at all possible, to the manufacturers, sending one drummer to the factories and another to the Hardware trade.

DELAWARE.—We consider the complaints referred to as likely well founded, and that circumstances here would justify a similar statement, though we would not specify cases or enter into particulars.

ILLINOIS.—There seems to be an increasing tendency in this direction. Es-

pecially is it the case with jobbers. It interferes with my trade to a considerable extent, besides being a great deal of annoyance.

CONNECTICUT.—We are more or less annoyed by manufacturers quoting prices and selling goods direct to our customers, as is probably the case with every wholesale house. In some lines of goods we think the manufacturers are pushing for the smaller trade, but generally we find very little difference as regards our trade.

DELAWARE.—The trade has suffered annoyance and very great loss by the practice of manufacturers and large jobbers in catering directly to the consumers. The epidemic of pool and trust organizations which has been prevalent during the past three or four years, we think, has been the chief cause of bringing the manufacturer and consumers together. For example: The manufacturers of a certain line of goods would organize and agree to the same price, without regard to the quality of the goods, thus, of course, obliging the middleman to buy the best quality, and the manufacturer of the poor quality, not being able to move his goods through the jobber, was driven to sell directly to the consumer, and the consequence was that soon all manufacturers were obliged, for their own protection, to work directly with the consumer.

Another very serious cause has been the matter of urging sales by dating the invoice from one to three months after the shipment of the goods.

The greatest injustice of this system is shown in the fact that we are obliged to carry a large stock and meet the low prices named our trade by the manufacturers, sell in small quantities at these cut prices and take notes in settlement, renewing them from time to time, while the manufacturer sells our trade for cash and in large quantities, leaving the paper here and sending the cash away.

We believe that if there is not a change made that eventually the manufacturer will have to add another department to his business—that of jobbing.

ALABAMA.—We have noticed a growing tendency in this direction, but it is hard to estimate amount of damage done. We, of course, do not suffer as much as those of the trade located near the manufacturing centers.

INDIANA.—Of late we have been bothered more or less with manufacturers, and especially jobbers, selling to consumers in this part of the State. This is done more particularly in Barb Wire and Merchant Iron.

FLORIDA.—The practice of manufacturers selling their goods direct to the consumer is in our case probably a matter of greater annoyance than any one else in the country. We are situated in a section of the country that is a great resort for overworked and elderly people and many of the manufacturers who come during the winter in search of rest and health endeavor to unload a sufficient quantity of goods to make expenses; this they generally do at a less price than we would care to sell, which has the tendency of fixing the price for future transactions. We think it is an evil which if

properly called to the minds of the manufacturers would be very quickly remedied.

INDIANA.—We have been very much annoyed by the practice of manufacturers and jobbers selling to our trade, and ever since the F. M. B. Association was organized in our State the tendency has been more in that direction. Feeling ourselves unable to do anything to counteract it we have patiently endured.

ILLINOIS.—We have found an increasing tendency in this direction. We have had several very extraordinary instances of jobbers selling direct to consumers. One we have in mind is that of a large Paint firm of Chicago going to the trouble of hiring a team and going out in the country to sell a job of Paint. But we beat them by selling at their prices, or cost to us. In some lines we think that the fault is in the retailers forcing them to sell so cheap that they have to sell wherever they possibly can, making them a larger aggregate of sales.

If there was concerted action taken on the part of the retailer and jobber to stop the manufacturer from selling direct to the consumer, it would probably stop the jobber from doing the same thing.

CONNECTICUT.—We are annoyed by manufacturers and jobbers (particularly the latter) quoting consumers lower prices than to the dealer. Many consumers do not fully appreciate the retailer carrying a stock to order from when needed, but will buy of agents or direct from the manufacturers, many times paying more for goods than the regular retail prices.

ALABAMA.—Regarding the practice of manufacturers and jobbers selling goods to consumers, the only trouble we have had in this direction is with jobbers of Firearms and Sporting Goods in St. Louis and Philadelphia—St. Louis more especially. There is a certain large jobbing house there in this line that regularly send circulars with their lowest prices to men, women and children all over the country regardless of their "race, color or previous condition." All such firms should be systematically boycotted by the trade.

Trade in St. Joseph, Mo.

WE ARE INDEBTED to the Wyeth Hardware & Mfg. Company, St. Joseph, Mo., for the following advices in regard to the condition of things in that section of the country and the prospects for the future:

Business for the past three months shows a handsome gain, when compared with same time in 1892, and the showing continues favorable. It will be remembered that the long-continued rains and floods in April and May of last year quite seriously affected business in those two months, so that normal conditions this year will doubtless bring considerable increase. The continued drought in Western Kansas is the one unfavorable feature. Very little of the wheat has sprouted and farmers are putting in corn in its place with but little hope of a crop of any kind. After several poor years, 1891 and 1892 brought exceptionally generous harvests to that section, so that there

is no immediate danger of famine. The traders who survived the hard times took on with their experience eminently conservative views, which they have put to good use in the recent good times, and are now in snug shape financially, and have but little indebtedness. Collections are good, and conditions generally may be said to be favorable to a healthy and satisfactory business.

After Mexican Trade.

By WM. H. MAHER, TOLEDO, OHIO.

VII.—Southern Mexico.

ON OUR WAY from Puebla to Vera Cruz we made a stop at the city of Jalapa, from whence was named the jalap root of the medical world; a root that most of us remember with any thing but pleasure.

There I saw American furniture in private and public dwellings, also an Emerson piano, and plated ware of the Wilcox Silver Plate Company's make. In a retail store were Collins & Co.'s Machetes, and John Russell Cutlery Company's Cigar Knives. In a grocery store I saw Armour's canned goods; New York condensed milk, and Duryea's starch.

At Vera Cruz the mercury was 88° and we had no desire to stay in that disease-breeding city one hour longer than was necessary. In the offing lay our steamship, the "Orizaba," and the dock was covered with freight just brought in on the tenders, for at no harbor on the Gulf of Mexico can an ocean vessel get to the wharf.

I started out about 10 a.m. to examine this freight, see what it was and from whence it came, but the sun was too hot for me and I missed an interesting point of information.

We hurried on board our vessel, but had to lie 48 hours at anchor while "a Norther" spent its force on the Gulf. When we started on our journey we sailed northward, our first stop being off the mouth of the river on which is the city of Tuxpan. Here we took on honey in barrels, and a large number of bales of what we were told was the gum used in tutti frutti chewing gum.

At Tuxpan our Mr. Hire, of root beer extract fame, left us to take an eight day's ride into the interior to make contracts for vanilla beans, in which he is a large dealer.

We still sailed northward along the Gulf, and our next stop was at the ambitious little city of Tampico. We cast anchor in the middle of the river about 8 p.m., and the city, lit by electricity, made a pretty picture. The mosquitoes visited us before the customs officers could reach us, and they spent the night with us.

Tampico ambitiously announces itself as the future New York of Mexico. A large amount of money has been expended upon the channel, and two railroad lines lead into the interior.

Here we took on a large amount of sarsaparilla root and some coffee. The city is the distributing point for a large area, and a fair share of American goods, was found on the shelves of the various stores. Our party made no effort to do business there, for the sun was killing

hot to people wearing heavy clothes, as we were.

Leaving Tampico we now crossed the Gulf to the southeast for Campeche. Owing to shallow water we could not go nearer the coast than seven miles, but a little steamer brought out freight to us and took back what we had for that port. We took on dye woods and beans. We unloaded miscellaneous merchandise, the larger part of it being foreign goods shipped via New York. Among this latter stuff was a large lot of biscuits, or fancy crackers from England. The only American article that I saw sent ashore was Baker's borax.

Our next course was east to Progreso, the port from whence is shipped the larger part of Yucatan sisal.

Here we took a special train to Merida, one of the most interesting centers in Mexico. On our way we stopped at a hacienda, or plantation, to visit a mill where the fiber was extracted from the leaf.

I have sold a good many coils of sisal rope, as has, no doubt, every one of your readers, and in the past ten years sisal binding twine has been of more importance than has rope, I was glad of an opportunity to visit it in its own home, and perhaps your readers may think a word or two about sisal is a "trade item."

We rode through 30 miles of about as thin and poor-looking a limestone country as one often sees, one that is too poor to grow almost anything, except the cactus, but on each side of us great rows and fields of the sisal plant were growing, and the very poverty of the soil makes the country rich. Upon good ground the leaf runs to pulp rather than fiber, and by starving the plant it gives back the best returns.

The plants are set out about 8 feet apart; the new growth is from the center and at the top; the older leaves are the lower outside ones; a plant is five to seven years old before the first leaf is ready to be cut. These leaves are about 36 inches long, six or eight inches wide at the stalk end, and taper to a point. They feel leathery, as all cactus leaves do. As the older leaves that are left on the stalk are ready they too are cut, and this process is kept up till the plant is exhausted, say 15 to 20 years from the time it was planted.

Yucatan is one of the most prosperous States in Mexico, and her riches come from her sisal plantations. The exportation of sisal has increased from 52 million pounds in 1882 to 117 millions in 1892. And in value from \$2,739,556 to \$3,399,947. Of this output 325,855 bales came to the United States, while all the rest of the world took but 27,620 bales. We were told that the fiber cost 4½ cents per pound, Mexican money, while it sells for 6 to 6½ in New York, equal to 9 cents Mexican. It will be seen that the profit to Yucatan growers is six million dollars in Mexican money for the 1892 crop. Is it any wonder that Americans are loved there?

We have no such warm friends in Mexico as in the hemp growing State, and American goods are given the preference there when the trade is sought for. But it is a section not so easily reached as the Northern cities, and our manufacturers do not look after the trade of Yucatan.

On the dock at Progreso I saw several large water purifiers from the Hoppes Mfg. Company, Springfield, Ohio; also a large amount of Iron Pipe from the Reading Iron Company.

All the coaches on the railroad, and the tram cars, were made by the J. G. Brill Company of Philadelphia, and Mr. Brill, who was with us, was given a nice order for new cars and supplies.

The press used for baling sisal was made in Liverpool. Some pine lumber from Mobile was being unloaded from a sailing vessel.

In Merida I saw goods made by the Wilcox Silver Plate Company; Drillings from Lowell; Mrs. Potts' Sad Irons; Barber's Braces; Lalance & Grosjean Mfg. Company's Pressed Tinware; Scandinavian Locks; F. J. Meyers Mfg. Company, Wire Goods; Loring's Tacks; Seymour Shears; Northampton Butcher Knives; Merwin & Hulbert Revolvers; Acme Cast Shears; Covert's Snaps; Ames Shovels and Spades; Bridgeport Steel Squares; Disston's Saws; Clark's Saws; Stanley Planes, and Parker Coffee Mills.

I made the acquaintance of a young man who said he had sold \$300,000 worth of Carriages in Yucatan in the past five years, but I am afraid I misunderstood the figures. Asked whose goods he bought he said Amesbury, Mass., ordinary goods; and his heavy Carriages, public and private, in France.

He also dealt in furniture and said he had just taken a contract to furnish a large government building, including carpets, at a cost of about \$16,000. He handled only American furniture, but so far had done nothing in carpets until this present contract.

The Indian in Yucatan is a more energetic and intelligent looking man than is the Indian of the North. He is better paid, hence better fed, and has money to spend for a few of the comforts of life. The women dress entirely in white and use edgings and laces quite freely.

It is a hot country—92° that February day. I am afraid to think what it must be in the dog days. But the night was quite cool, and we were told that this is also the case in the hotter months.

The American manufacturer who drums Mexico and leaves Yucatan out of his list makes a mistake, unless his goods are of a kind not used there.

This was our last stop in Mexico; when next we cast anchor it was in the harbor of Havana. We were ten nights on the Gulf of Mexico, and had still a four days' ocean ride to New York.

The day in Havana was oppressively hot; we were cautioned not to walk in the sun, as there was danger there for us Northern folk. The streets were vile smelling; there was no inducement to stay. Prices were on a cut-throat basis; as a mere straw, ice water called for at dinner added 20 cents to the bill!

Some of our party left us here to go home by way of Florida, and take more time to look up Cuban trade. One of these has written me that he was successful beyond his hopes.

I had an excellent opportunity, of which I availed myself, to learn about Bicycles, &c., from the principal dealer in such goods in Havana. He buys a share of his

stock in the United States; Bicycles from the Gendron Iron Wheel Company of Toledo, and Tricycles from the Toledo Metal Wheel Company. He sells more Tricycles and children's Bicycles than he does adult machines. The larger part of his goods are Belgian manufacture; he can buy a boy's Bicycle there for \$8, as against \$20 for no better machine in the States; claims the foreign machines are stronger and the rubber tire far ahead of the American. The duty is 50 per cent. less on our goods, yet even with this in our favor the Belgian are the cheaper. In adult machines the Cuban wants one weighing 42 to 44 pounds. The Cuban sand is very hard on pneumatic tires.

Talking with this gentleman about the duty, he said the Spanish officials interpreted the law to suit themselves. He had bought of the Maine Mfg. Company, ten gross of tin toys at \$10 per gross. The Cuban Government demanded a duty of \$580 on the lot. He paid under protest and called our Government's attention to the violation of the reciprocity treaty in this, but has had no assistance yet.

These end the notes I made of American goods on my trip, and in my next paper I will mention what seemed to me to be good openings for business in Mexico. If any who have followed these notes desire specific information regarding goods I have not mentioned they are welcome to write me, and if I can answer their questions, or help them to an answer, I shall be very willing and glad to do so. My address is at the head of this article.

Prize Competitions

\$25.00.

Prize Competition No. 21.

SUBJECT:

The Safety Line in Credit Business

Among the causes to which the failure of 95 per cent. of business enterprises are attributed, that of extending too large a line of credit is prominent. This competition is designed to draw out from the trade their ideas of the limit beyond which it is deemed unsafe to go in extending credits. Suggestions may be given in regard to this matter, touching upon such points as the following:

Should the definite amount of credit to be given be decided upon at the beginning of the year?

Is this to be fixed at a certain percentage upon the gross sales of the previous year?

Or, should it be an amount proportionate to the stock carried?

Is it better that the amount of credit extended to individual customers depend upon the circumstances at the time?

This competition will remain open until May 13, 1893.

Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose

for which these competitions are announced.

The following prizes will be awarded:

First prize	\$12.50
Second prize	7.50
Third prize	5.00

The prizes will be awarded for answers which in the judgment of the committee of award are most suitable for publication and of the most general interest. We reserve the privilege of extending the time on any competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. These competitions are open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than May 13, 1893. They should be addressed as follows:

DAVID WILLIAMS,
96-102 Reade street,
New York.

Prize Competition No. 21.

The committee to whom the contributions in Prize Competition No. 7 were referred have awarded the prizes as follows:

First Prize of \$50 to L. A. TURLEY, Boston, Mass.

Second Prize of \$25 to WALTER DISCOUNTS, New York, N. Y.

Third Prize of \$15 to FRANK KAVANAUGH, Rusk, Cherokee Co., Texas.

Fourth Prize of \$10 to W. D. FORREST, Boston, Mass.

Other Competitions which have closed are now in the hands of the Committees of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a great deal of valuable information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 18. Closing April 22.

The Extent to Which Merchants Should Devote Their Attention to Outside Interests.

No. 19. Closing April 29.

Electrical Goods as a part of a Hardware Stock.

No. 20. Closing May 6.

A Reliable System for Securing the Correct Charging of All Goods Sold on Credit.

No. 21. Closing May 13.

The Safety Line in Credit Business.

Another subject will be announced in our next issue.

THE WILLIAM SCHOLLEHORN CO., New Haven, Conn., have so far recovered from the effects of the recent fire at their works that since April 13 they have been running full time, and before long they hope to be entirely free from any hindrance occasioned by the fire. It will be remembered the damage was confined principally to the Shear and Plier departments.

Manufacturing.

CHAMPION SAW COMPANY, Beaver Falls, Pa., are now erecting a new plant, which they hope to have ready for occupancy by June 1. They are intending to equip it with all the most improved Saw manufacturing machinery, and will be in position to do more and better work than heretofore. The plant will consist of a main building, boiler house, temper shop, oil house, stables, &c.

The Squires Hardware Company, Penn Avenue, E. E., Pittsburgh, Pa., whose building was recently destroyed by fire, have perfected arrangements for the erection of a new building block, work on which will be commenced in a short time, and which is expected to be ready for occupancy by September 1. The new building will be of brick, with stone front, and will be five stories high and measure 27 feet in width by 150 feet deep. The first two stories and the basement will be occupied by the Squires Hardware Company, while the other three stories will be rented for office purposes. The building will have both a freight and passenger elevator and other modern conveniences. It is expected to cost between \$30,000 and \$40,000.

Fire recently destroyed one of the warehouses of Lovell, Tracy & Co., Hartford, Conn., used for storing and compounding. The loss is fully covered by insurance. This department had no connection with their grease-making business nor any of their specialties. While suffering some inconvenience, the firm are progressing as usual and filling all orders with little delay. They express satisfaction that the building destroyed was not the one in which their Axleline is manufactured, trade in this article being referred to as booming this spring.

The W. J. Kelley Company, Greenville, Ohio, announce that their Screen Door Frame warehouse was entirely destroyed by fire on the night of the 11th inst., with all the accumulated stock which they had ready for shipment. The company express their regret that there will for the present be some delay in filling orders, but they have secured other store rooms, and are confident that they will be able to fill orders completely before fly-time.

The Stuart & Peterson Company issue a circular giving views of their works at Burlington, N. J., additions to which are in process of construction. The plant is 200 x 410 feet in size, having both rail and water shipping facilities. The line of goods manufactured include Tinned, Enameled, bright and plain Hollow Ware, Ice Cream Storage Cans, Hardware Specialties, Refrigerator Tanks, Cooler Wells, Chemists' Goods, Jacketed Kettles, &c. The Philadelphia office is at 1020 Arch street, but communications should be addressed to their main office, Burlington, N. J.

The Gender & Paeschke Mfg. Company of Milwaukee, Wis., have been obliged by the ever increasing demand for their goods to add very largely to their machinery for the manufacture of Tin and Galvanized Iron ware. They have just put in one of the newly patented wiring machines brought out by G. A. Crosby & Co. of Chicago, having been among the first to make practical use of it. They are now busily engaged in making up a stock of coal hods for the fall trade. In past years they have always been oversold in this line, but expect to be in shape to meet all demands this season. The company are now very extensive manufacturers of Galvanized Ironware. This ware they make from Sheet Steel and galvanize it after it is made up by coating it with molten zinc, which fills up all seams and crevices, and makes the completed article strong, durable and absolutely rust proof.

Commercial Travelers' Day.

The Columbian Associated Travelers, composed of the commercial travelers of the world, will celebrate Commercial Travelers' Day July 26 at the Chicago Exposition. The entire week of July 24 to 29 will be consumed by the traveling men in celebrating this event, as follows: Monday, July 24, gathering of commercial travelers' associations and organizing those not members of any association into bodies for parade; Tuesday, July 25, grand parade down town; Wednesday, July 26, "Commercial Travelers' Day" at the exposition; Thursday, July 27, excursion on the lake; Friday, July 28, will be devoted to amusements, the full details of which have not as yet been arranged; Saturday, July 29, commercial travelers' meeting for the consideration of such matters as interest them in business. The indications at the present time point to an attendance from the United States alone of over 100,000, while Canada will send a small army, and England, France, Germany, and even far-away Australia have delegations ready to come, and have asked for places in the ranks. The commercial men of America have it in their power to make their day the banner day at the exposition. The Board of Directors of the Columbian Associated Travelers will assemble in Parlor A, Tremont House, Chicago, on Saturday, April 29, for the purpose of perfecting the programme for July 26. At present it is only known that in Festival Hall a grand concert will be given by the united bands of the country. These bands will be brought to Chicago by the different associations, and after their arrival will be united into one great band, numbering nearly 2000 instruments.

Price-Lists, Circulars, &c.

J. W. KELLY & SON, Bristol, Conn.: Grennan's Sash Pulley Marker, and Throop's Sash Weight Fastener. The Marker is for marking Common Sense sash pulleys, and will mark, the manufacturers state in ten minutes what would take five hours the old way. The Sash Weight Fastener is used for fastening cord to weights, obviating the tying of the cord and consequent waste.

CRESCENT STEEL COMPANY, Pittsburgh, New York and Chicago: Tool Steel, Bit and Reamer Steel, Shaped Mining Drill Steel, Implement Steel, Welding Steel, Spring Steel, Machinery Steel, Steel Forgings, Hammer, Frog and Band Saw Steel, Hot Rolled Sheet Steel, Cast Steel Saw Plates, Crescent Steel Wire, Special Drill Rods, &c.

LOWELL SCALE COMPANY, Lowell, Mass.: Scales and Weighing Machines. A circular illustrates their 600 and 1000 pound Scale, having brass sliding poise, cast steel and hardened bearings throughout, self-adjusting platform bearings, hardwood pillar and cap. The Scales are finished in natural wood or painted, as may be desired.

PARR REGISTER & MFG. COMPANY, Buffalo, N. Y.: Hot Air Registers and Ventilators. Their price-list No. 3 illustrates and describes these goods, with prices. Attention is called to the superiority of their line, and to the fact that particular

care is given to fitting, so as to make a good, smooth-working Register. It is stated that these Registers are the standard size, and are interchangeable with other leading makes.

BROAD GAUGE IRON STALL WORKS, Boston, Mass., Frank O. Worthley, proprietor: Stable Fixtures. Illustrations are shown of Mangers, Racks, Gutters, Stall Guards, Harness Hangers, Window Ventilators, Water Troughs, Wagon Jacks, Stable Requisites, Overhead Safety Hitch, Vanes, Posts, &c.

SHAW & CLANCY, Racine, Wis.: Reliable Weed Killer. The device is described as being so arranged that the operator stands in an upright position and cuts the weed root below the surface, after which a small quantity of common dry coarse salt is deposited upon the top of the cut root by the tool. It is stated that the whole operation takes but a moment. The salt is designed to kill the root of the weed.

C. W. HACKETT HARDWARE COMPANY, St. Paul, Minn.: Bicycles and Bicycle Sundries. Illustrations show a line including the Union, Sterling and Diamond Wheels; also of medium grade Bicycles, Velocipedes, Tricycles and Sundries. The fact is referred to that the line has been carefully selected, and that it has been their endeavor to get together a line representing the best value for the money.

Mexican Trade.

WE HAVE RECEIVED the following letter from F. E. Myers of F. E. Myers & Bro., Ashland, Ohio, and vice-president of the Association of American Manufacturers, which has been organized for the promotion of international trade, relative to the trip to Mexico, which was recently undertaken by members of the association. Mr. Myers' remarks on the subject of trade with Mexico and the opportunities presented for a material extension of our business relations with that country will be read with interest:

Our Mexican trip was certainly the most gratifying and generally satisfactory excursion that I ever joined. During the trip we discovered that while the business of Mexico with the United States, both in exports and imports, was larger than all other countries combined, in the matter of manufactured merchandise England, France and Germany have the greater share of her trade. This is due to a great extent to the cheap labor of Europe as compared with the wages paid in the United States, but it also arises largely from the fact that the Mexican trade has hitherto been neglected and overlooked by our home manufacturers.

Our party was perhaps more favorably received and made a more impressive excursion into that Republic than any that has ever visited it from the United States or any other country, the combined capital represented being estimated at \$42,000,000.

The courtesies extended us all along the line of travel, and the action of the officials, traders and merchants throughout the Republic indicated most clearly their kindly feeling to the United States, and their disposition to deal with us more extensively, making it very apparent that now is the time to secure that trade, the

demands of which are growing daily, and, although varied require a great many of our class of implements. After a careful examination of the goods sold in the Mexican markets and the prices paid there I believe the present is the time to inaugurate a vigorous business policy with the merchants of that country. We were assured by those in highest authority in Mexico of their desire to increase the trade between the two countries, and Mexican merchants, because of their nearness to the point of supply, would certainly give our goods the preference over those of Europe if prices were no higher. During our visit and at our banquets we, in exchange for their great courtesy, earnestly solicited a visit from them during the period of the World's Fair, and the indications are that a large number of dealers can be reached at that time, many of them having promised to come, when we will take pleasure in introducing them to manufacturers generally. I believe our excursion certainly stimulated them to come, and in this respect will be very effectual.

Buck Bros'. World's Fair Exhibit.

BUCK BROS., Millbury, Mass., have prepared an exhibit of their tools for the World's Fair which is described as particularly attractive. An exhaustive line of tools is arranged in a case, resting on a solid black walnut paneled counter. The case is of plate glass, with German silver mountings, with the firm name in gilt across the front, the back being composed of heavy beveled mirrors. The interior of the case is made in pyramid form with four lifts, rising from the bottom of the case. The case is lined with black velvet, edged with a handsome galloon in gold and black. The base of the case will show a line of Tang and Socket Chisels, also Gouges, Plane Irons, Screw Drivers and Turning Tools. On the first rise is shown a line of wood carving tools in great variety. The third and upper steps are occupied by Reamers, Countersinks, Nail Sets, Cold Chisels, Screw-Driver Bits, Punches and an endless variety of special tools made by this firm. The exhibit will be protected in front by a fancy ebonized railing. This firm received the highest award and a diploma at the Centennial Exposition in 1876, for "superior quality and beauty of finish," as well as special mention by the British Commissioners in their report presented to both houses of parliament. The exhibit is referred to as far ahead of the firm's Centennial exhibit, and was specially arranged by the managers, Edward M. Wood and William L. Proctor.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Certain publications cyclept trade journals supposed to be closely identified with the Paint and allied trades continue the

farce of printing words intended to convey the impression that the market for leading pigments is on the ragged edge. There is more than a vague possibility that novices in the reportorial line, whose experience is too narrow to enable them to refrain from relying too much upon shadowy rumor or specially manufactured news, to grasp the true situation. In fact, the surface appearances are that a would-be representative journal of the trade unwittingly misrepresents the condition of the market for various lines of goods, the advertising patronage from which is apparently unsatisfactory. Particularly is this suggested in some peculiar effusions regarding White Lead. The facts are that, considering the drawback of adverse weather conditions, business the past week and since the beginning of the month has been remarkably good. Sharp competition for business on the part of manufacturers and importers, with here and there specially low prices quoted, naturally keep buyers watchful and prevent ventures in the speculative direction. That circumstance, in turn, serves to check any upward movement in values. Hence a rather quiet condition of affairs for the spring season, despite general report that distribution of most lines of goods is fully up to the average for the season.

White Lead.—Reports appear in print suggesting that the leading corrodors are greatly annoyed by "outside" competition, and, to protect the "official" list, make what is commonly termed "fake" offers of one kind and another. As previously explained in this column, the National Lead Company, or, at least, some of its branches, have made special prices to large distributors in certain territory where "outside" competition has been particularly vigorous; but movement in that connection is more conspicuous in imagination than in fact, and were it not for the sacrifice of profits made by jobbers who put out high-grade Lead as a "leader" to capture orders for some of their profitable specialties, there would doubtless be less rumor of "cut" prices by corrodors. Manufacturers of "quick process" and mixed Leads continue energetic and push their specialties vigorously, but all accounts go to show that the corrodors who turn out the old reliable Dutch process Lead are more than holding their own against the "cheap John" rivals here and in Western markets. With the aid of high grade tinting colors at comparatively low prices those corrodors make serious inroads upon the opposition, good, bad and indifferent. There are faint grounds also for the suspicion that the combined corrodors have a decided advantage in the present condition of the market for raw material, since they bought heavily when prices were lowest and are now well protected by reduced production, particularly in Idaho, due to low average prices latterly for Silver and Lead ores. There is some Western competition in this market, but the facts are exaggerated in certain quarters quite as much as some statements were a few years ago in a trade publication that was belligerent until the Standard Oil Company practically secured controlling interest for a time and then, as now, supposed to be the organ of the Petroleum and Paint trades.

Red Lead and Litharge.—Rumors of cut prices on these commodities, as well as on White Lead, still have circulation, and rest on quite as slender foundation. In other words, the concessions are almost invariably made on inferior grades, and attributed to Western concerns that do more in talk than in actual business. Foreign product moves out slowly and in small quantities, being relatively dearer than the domestic article.

Zincs.—New orders for American Oxide come forward slowly, but deliveries on old contracts are liberal, and, in connection with the upward turn in cost of crude material, seem to hold the market quite steady. Foreign Zincs sell in routine way only, and chiefly at old prices.

Colors, &c.—There have been no new developments in the market for any line of Dry or Oil Colors. Business is not as brisk as might be expected at this time, yet the distribution makes a good showing, all told, and prices as a rule hold very steady.

Oils and Turpentine.

The uncertain position of the market for Lard and inferior greases is still a disturbing factor in the market for most lines of Oils, lubricants and soap-making kinds particularly. Speculation is tame, since leading operators seem inclined to proceed cautiously pending developments, and jobbers and consumers are buying only as well defined wants dictate. In other lines there has been no movement calculated to excite interest on the part of buyers or sellers. For that matter affairs remain *in statu quo* outside of those lines of Oils directly affected by the movements in prices of Lard and Tallow, and business is at present almost wholly of hand to mouth character.

Linseed Oil.—Large jobbers who have in stock outside brands of Oil purchased some time ago at low prices are credited with selling ordinary quantities at 49¢ or a shade under to customers who give attractive orders for other lines of goods. In other words, the fortunate late buyers of cheap Oil are using the latter as a "leader" or "trade winner," something in the same way as they peddle out popular brands of White Lead at cut prices. City manufacturers stand firmly to old prices, however, and it does not appear that outside brands are offered at any concession from first hands. Business is only fair at present, but deliveries in execution of former orders are still on a fairly large scale.

Cotton Seed Oils.—More than ordinary caution is observed by large operators in this class of Oils. Manufacturers of Lard compounds are slow buyers, local speculators are extremely indifferent and speculators devote attention chiefly to endeavors at solving the problem of which is the safest direction to move. Some parcels of prime quality Oil have been placed at 40¢ at 41¢ for crude, 46¢ @ 47¢ for summer yellow, 47¢ @ 48¢ for summer white and corresponding prices for winter Oils, but "off" grades went at more than the usual concession and are slow of sale at the present time. The near future of the market is dependent largely upon the movement in Lard and in that line purely speculative movements are the governing influences at present.

Lard Oil.—Business has been almost at a standstill. Buyers have purchased only as imperative wants necessitated, and evidence is not wanting that substitutes, and adulterants are being employed as much as possible. However, the market for raw material is the key to the situation, and at present so unsatisfactory that both producers and consumers observe more than ordinary caution. For the present none but purely "nominal" quotations are given on wholesale quantities, and those are very much the same as the figures quoted a week ago.

Fish Oils.—There has been no movement in Crude product, Sperin Whale, or Menhaden. In the absence of business former prices prevail among holders. The manufactured products have been moving in small parcels, chiefly at about former prices.

Miscellaneous.—Tallow Oil is dull at prices on the basis of 60¢ for prime. Neatsfoot is steady in price, but slow. Coconut barely holds its own although cable advices report primary markets firmer. Common Olive Oil is slow at last week's prices.

Spirits Turpentine.—Late low prices have served to stimulate purchases by large consumers and prices are somewhat firmer in consequence. There is, however, very little speculative interest. Late trading in round lots was chiefly at 32¢ for regular, and 32½¢ for machine barrels.

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The Yankee Wrench.

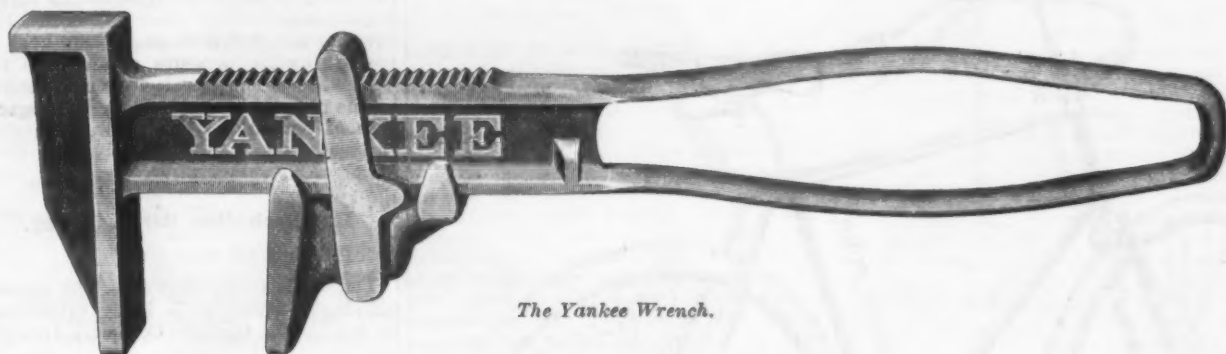
The Gwinner Mfg. Company, Hamilton, Ohio, for whom Harmon & Dixon, New York, are agents, are offering the above wrench as shown herewith. The wrench is 9 inches long, weighs 12 ounces and is

The Gem Cake and Batter Mixer.

North Brothers Mfg. Company, Philadelphia, Pa., are offering this household article as shown herewith. The metal part of the beater consists of steel bands $\frac{1}{4}$ inch wide bent and inserted in a wooden

New Bicycle Lock.

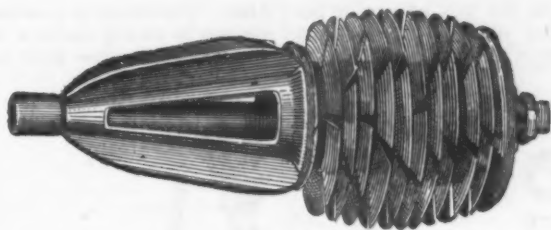
The accompanying cut represents a lock being put upon the market by the Smith & Egge Mfg. Company, Bridgeport, Conn. The lock is formed of two corrugated brass shells, with shackles of steel rods, and is

*The Yankee Wrench.*

made entirely of malleable iron. In adjusting it the lower jaw is slipped along to the required position, when the yoke drops into one of the notches at the top, holding it firmly in place. It is quickly adjusted and, the manufacturers claim, never slips.

Peerless Steel Flue Cleaners.

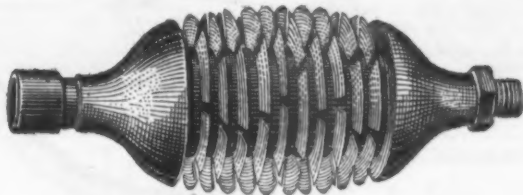
The flue cleaners illustrated in Figs. 1 and 2 are put on the market by James T. Mackay, 5745 Garfield avenue, St. Louis, Mo. Fig. 1 represents the style in which cleaners 6 inches and over are made; while sizes under 6 inches are made as shown in Fig. 2. The cleaner is made in all sizes of Jessop's English steel, with composition washers made especially for this purpose. The manufacturer states

*Fig. 1.—Peerless Steel Flue Cleaner.*

that, owing to the quality of material used, and to the fact that the only drag is on the edge of their disks, the cleaner is durable and unbreakable in the flue. It is also claimed that its construction is such it can be made to fit the inside of the flue, and being conical or tapering in shape, only a few of the middle disks drag, resulting in light running; also, that guides prevent its catching at the rear of the

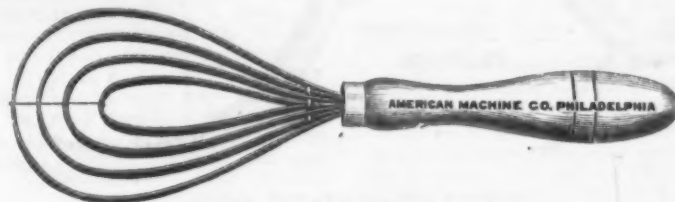
tended for mixing all kinds of cake and for beating up batters.

HART MFG. COMPANY, Cleveland, Ohio, announce that the contract heretofore existing between them and H. A. Rogers, 19 John street, New York, whereby he acted as the company's agent in New York, has been terminated, and in future

*Fig. 2.—Small Size Peerless Flue Cleaner.*

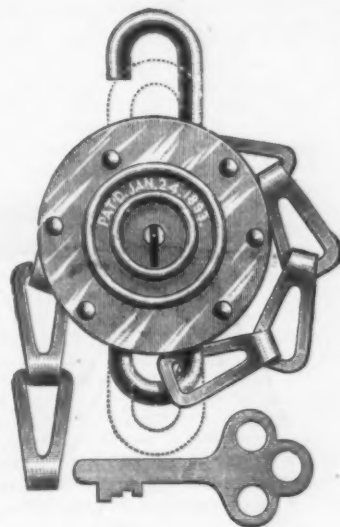
boiler. The point is made that the cleaner has no spring to lose temper in the hot flues; that being firm it never slips under the scales, and that owing to its compactness it does not leave any loose soot in the bottom of the flue.

orders for Duplex Die Stocks should be sent to the factory in order to secure bottom prices. The company report business as very good, their trade for the past two months having been 25 per cent. greater than for any former similar period.

*The Gem Cake and Batter Mixer.*

pointed out that one of its important features is the tenderness it imparts to everything beaten with it. The device is in-

supplied with 15 inches of strong steel chain, all polished and nickel plated. The lock has four tumblers; the number of tumblers being referred to by the makers as making the lock practically unpickable, and each lock is supplied with two keys. The dotted lines in the cut show the position of the shackle before unlocking. To fasten the lock it is only necessary to push the shackle down into

*New Bicycle Lock.*

place. The lock is shown actual size in the cut, weighs less than 3 ounces, and is small enough to carry in the vest pocket.

THIEVES recently broke into the store of W. I. Priest, Bicycle and Typewriter agent, 170 Superior street, Cleveland, Ohio, and stole a Sunol Bicycle he had on exhibition as a sample. Mr. Priest is handling the Sunol Wheel for the McIntosh, Huntington Company, and the latter are assisting the police in the effort to apprehend the thieves.

Raymond's Bicycles.

C. F. Guyon Company, 99 Reade street, New York, agents for Raymond Bicycle Company, Boston, Mass., are offering the wheels shown in Figs. 1 and 2. The prin-

cipal features of the machines are the pneumatic pump, self-lubricating bearings and concealed brake. The pump is within the upright tube which contains the seat post, the post being lengthened by the addition of an aluminum tube. On the end of the extended tube are two leather washers, which fit the upright tube containing

either of the tires is easily and quickly inflated. The pump, it is claimed, adds nothing to the weight of the wheel, and is powerful and simple in construction. It is also always in place when needed. The brake rod is concealed in the handle bar

The lacings on the rear wheel of the ladies' machine are composed of separate pieces of elastic cord sufficiently long to reach from the mud guard to the hub and back to the mud guard. Holes at the mud guard receive metallic hooks attached to the ends of the cords, and at the hub the cord is slipped over hooks. This allows the lacing to be readily removed for cleaning the wheel or for other purposes. The tires are not cemented on, but are held in position by the pressure of air from the inner tube. The wheels are recommended by the manufacturers as being the highest type of perfection, both in workmanship and material.



Fig. 1.—Raymond's 1893 Safety.

post, thus protecting it and giving a neat appearance to this part of the machine, and admits of the front wheel being turned entirely around without interfering with the brake. The brake can be regulated by a thumb nut on the top of handle bar for greater or less pressure. It is stated that with the new device for oiling the

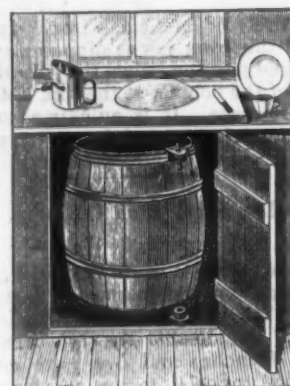
the seat post. At the bottom of the seat post is a valve, to which is connected a small piece of rubber tubing, the other end of which is connected to the valve in the tire. The screw which holds the seat post has only to be loosened when the pump is ready for use, and with a few strokes

bearings it is only necessary to oil once in three months. The oil is poured into the lower tube, which extends to the axle bearings, and is gradually fed through a section of felt into the cones and balls. The bearings in the wheels do not have this device, but are oiled in the usual way.

the barrel is not in use; and the manufacturers claim that a barrel thus swung can be operated by a child as readily as by a grown person. The swing is adapted for use in the home, also for grocers, hardware and paint dealers, or for any stores using barrels.

The Perfection Barrel Swing.

The barrel swing shown in the accompanying illustration is being introduced by the Leavitt Machine Company, Orange,



The Perfection Barrel Swing.



Fig. 2.—Raymond's Ladies' Safety.

the seat post. At the bottom of the seat post is a valve, to which is connected a small piece of rubber tubing, the other end of which is connected to the valve in the tire. The screw which holds the seat post has only to be loosened when the pump is ready for use, and with a few strokes

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Sultana Sad Iron.

William Vogel & Bros., selling agents for H. Clayton & Co., 37-47 South Ninth street, Brooklyn, N. Y., are offering the sad iron shown herewith. In Fig. 1

vide ventilation for the flame. The iron is also provided with an opening at the back suitable for admitting a gas jet, and gas may be used for heating the iron in place of alcohol. The iron is nickel plated and may be heated, the makers claim, in either

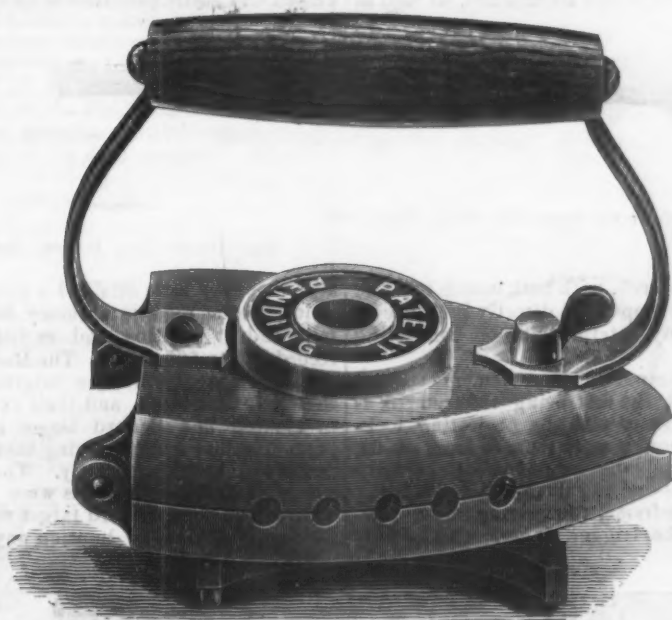


Fig. 1.—Sultana Sad Iron.

the iron, with stand, is illustrated, and in Fig. 2 the operation of heating the iron by alcohol. The top of the iron is provided with indestructible packing, which in operation is saturated with alcohol, lit, and the top turned down. The top and bottom of the iron are fastened together by turning the thumb piece near the front

way in from seven to ten minutes. They also state that the iron is perfectly safe.

The Perfect Tack Hammer.

L. A. Sayre, 334-338 Mulberry street, Newark, N. J., is putting the above hammer on the market, as herewith illustrated. The hammer is solid steel, carefully hardened, with ball faces and adze eye. The part of the hammer between the faces and eye has beveled edges. The claw is also of steel, that and the head being finely polished. The handle is of select white hickory. The eye of the hammer is larger



Fig. 2.—Sultana Iron Heated by Alcohol.

of the iron, and the flame striking against the bottom heats the iron for use. The stand is so arranged that when placed in position, as shown in Fig. 2, with the handle, they form a three-legged base to hold the iron in position while being supplied with alcohol and being lit. The openings around the sides of the iron pro-

vide ventilation for the flame. The iron is also provided with an opening at the back suitable for admitting a gas jet, and gas may be used for heating the iron in place of alcohol. The iron is nickel plated and may be heated, the makers claim, in either

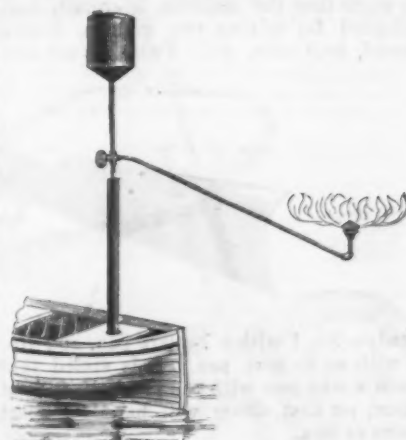


The Perfect Tack Hammer.

The Baker Fishing Lamp.

J. R. Baker & Son, Kendallville, Ind., are offering the above lamp, as shown herewith. The lamps are designed to be used when spearing or gig fishing, taking the place of wood jacks or pine torches. The point is made that with the lamps sparks, smoke, unsteady light, the constant dropping of coals into the water, the preparation of fuel and the frequent stop-

pages necessary to replenish the fire are annoyances not encountered. The gas-burning fishing lamps are made in two



The Baker Fishing Lamp.

sizes, No. 1, as shown in the cut, having a 5-quart tank and one burner; No. 2 has a 6-quart tank and two burners.

Bread Mixer and Kneader.

The accompanying illustration represents the Prescott-Stanyan Bread Mixer and Kneader, being introduced by Edwin Prescott, 8 Medford Street, Boston, Mass. It consists of a blade and guard revolved by a crank in a pan, which is set in the frame, the machine being fastened to a shelf or table. After the correct proportions of flour and moistening have been put in the pan the crank is turned and at the same time the pan is rotated slowly by hand until the flour is moistened sufficiently to move the pan itself; after which the pan is prevented from turning too fast by pressing lightly on the edge with one hand. After rising the machine is set in the pan for a second kneading. The guard is to prevent the dough from winding upon the blade, and should be as near



Bread Mixer and Kneader.

bread; that it will save half the time and more than half the labor; that the machine is simple and not liable to get out of order; with no more pieces to clean than the ordinary pan and spoon, and that with the

machine a boy or girl 10 or 12 years of age can mix and knead a batch of bread as easily as the strongest and most experienced woman in the old way. The point is made that the machine is equally well adapted for mixing rye, graham, brown bread, fruit cake, &c. Two sizes are now

breech loader are also contained in the Marlin; it can be used with great rapidity, the cartridge being dropped into the receiver ahead of the breech bolt when the action is open, instead of into the magazine. Also that the solid-top frame and side-ejecting action are retained, as well as

a strong shooting and accurate repeater of medium weight, that it is made in two sizes, 32-40-165 and 38-55-255, as shown in Fig. 3, and that it is the only repeater in the market for this ammunition. These two cartridges are referred to as being well known and easily procured in any section.



Fig. 1.—Octagon-Barrel Repeating Rifle, Model 1893.

ready—No. 1 with a 7-quart pan, and No. 2 with an 8-quart pan. It is stated that each works best with the pan half full of flour, yet that either will handle a quart more or less.

**Marlin Safety Repeating Rifle,
Model 1893.**

The Marlin Fire Arms Company, New Haven, Conn., are about putting this rifle

the solid breech, with both breech bolt and locking bolt operated directly by the lever without any intermediate or connecting pieces.

Several important improvements are also introduced, the first being referred to as the doing away with the projecting locking bolt, giving more room in front of the trigger, and the extension of the lever closing the opening flush with the lower part of the frame, thus giving more freedom to the trigger finger. No sear is

also that they have attained a great popularity, and as regards accuracy occupy an independent position, and as holding all records up to 500 yards. The Marlin Fire Arms Company were the originators of these two cartridges, and their experience in making fine Ballard target rifles for them warrants them in saying that this repeater will shoot accurately. The barrels will be exactly the same as were used by them in the finest Ballard target rifles, and for deer shooting or hunting any similar



Fig. 2.—Round-Barrel Repeating Rifle, Model 1893.

on the market in octagon and round barrels, as shown in the accompanying illustrations. The model of 1893 is similar in principle to their 1889 system. The standard length of barrel will be 26 inches, and a rifle with octagon barrel of this length will weigh about 7½ pounds, which weight is believed about right for

used in this model, and the trigger, acting directly on the hammer, has no lost motion.

Also that the lever catch is taken from the extreme rear end and placed in the lever just in front of the trigger, making the arm work smoother.

Another point of novelty is the firing pin, which is described as working as fol-

game they recommend this model. If a flatter trajectory is desired in 38 caliber cartridges loaded with express bullets can be used. Express bullets are made partly hollow, having a copper tube inserted in the apex. This does not contain any explosive, but lightens and stiffens the bullet, but for indoor or short-range work the regular 32-13-98 and 38-20-155 Marlin short-range cartridges can be used.

It is claimed that this model will also use cartridges varying in length from the standard maximum to the empty shell. Thus cartridges with shorter bullets, either loaded so to reduce the charge, or in which the bullets have settled down through continued jolting, will work through the action, and even with round balls inserted below the muzzles of the shells there is no clogging. The shells shown are both of straight taper, and for this reason can be reloaded with much better results than bottle necked shells.

The barrels are made from 20 to 32 inches in length, the number of shots being from 7 to 11. A carbine is also made in 1893 model, as shown in Fig. 4, with 15 and 20 inch barrels, for five and seven shots.

Reports come from Albany that labor organizations are endeavoring to create disaffection in the National Guard in antici-



Fig. 3.—Cartridges for Marlin Rifles, Model 1893.

hunting purposes. All rifles of this model will have case hardened frames. The working of the rifle is described as follows:

The cartridges are loaded into the magazine at the side of the frame with the action closed. When the bolt is withdrawn, the cartridge at the bottom of the

lowers: The first motion of the finger lever draws back the firing pin, which is made in two pieces, and the front end of the rear piece drops down into the slot in the breech bolt into which the locking bolt operates. When the firing pin is in this position it is held back positively, and it is impossible to drive it forward until the



Fig. 4.—Carbine, Model 1893.

magazine enters the carrier block gradually, avoiding concussion by the sudden jump of the whole column of cartridges with a momentum which might be sufficient to explode a sensitive primer. It is stated that all the advantages of a single

breech bolt is closed and firmly locked by the locking bolt. This makes a premature discharge impossible, and if in assembling the rifle the locking bolt is accidentally left out the rifle cannot be fired.

The manufacturers state that the rifle is

pation of trouble of some kind within another month, but it does not appear that more than a single regiment has lost men from this cause, nor does it appear that the efficiency of the organization has been impaired.

Current Hardware Prices.

APRIL 19, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&100@50&10&5 signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... 70¢
Excelior..... 70¢
North's..... 70¢
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

Eagle Anvils, 10 & 12 in..... 150¢
Peter Wright's..... 110¢
Armstrong's Mouse Hole..... 100¢
Am. Wrought, Horse shoe brand, 11 & 12 in..... 100¢
Trenton..... 100¢
Wilkinson's..... 100¢
Barnes Mfg. Co..... 35¢

Anvil Vise and Drill—

Miller Falls Co., \$18.00..... 20¢
Cheney Anvil and Vise..... 25¢
Allen Anvil and Vise \$3.00..... 40¢
Star..... 45¢

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Common Augers and Bits..... 70¢
Boring Machine Augers..... 70¢
Car Bits, 12-in. twist..... 110¢
Russell Jennings' Augers and Bits..... 25¢
Jennings' Pattern Car Bits..... 40¢
Jennings' Pattern Auger Bits..... 60¢
Small's Bits..... 60¢
C. E. Jennings & Co., No. 10, extension tip..... 90¢
C. E. Jennings & Co., No. 30..... 90¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 3/4, quarters, No. 5, 8; No. 30, 3/4, 5/8, 1/2..... 25¢
Lewis' Patent Single twist..... 45¢
Pugh's Black..... 20¢
Pugh's Jennings Pattern..... 20¢
L'Hommedieu Car Bits..... 15¢
Forster Pat. Auger Bits..... 15¢
Cincinnati Belt-Hangers' Bits..... 30¢

Bit Stock Drills—

Morse Twist Drills..... 50¢
Standard..... 50¢
Cleveland..... 50¢
Bryant's, for wood (wood list)..... 30¢
Bryant's, for wood (wood list)..... 30¢
Cincinnati, for wood..... 30¢
Cincinnati, for metal..... 45¢

Expansive Bits—

Clark's small, 1/8; large, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 3, 3 1/4, 3 1/2, 4, 4 1/4, 4 1/2, 5, 5 1/4, 5 1/2, 6, 6 1/4, 6 1/2, 7, 7 1/4, 7 1/2, 8, 8 1/4, 8 1/2, 9, 9 1/4, 9 1/2, 10, 10 1/4, 10 1/2, 11, 11 1/4, 11 1/2, 12, 12 1/4, 12 1/2, 13, 13 1/4, 13 1/2, 14, 14 1/4, 14 1/2, 15, 15 1/4, 15 1/2, 16, 16 1/4, 16 1/2, 17, 17 1/4, 17 1/2, 18, 18 1/4, 18 1/2, 19, 19 1/4, 19 1/2, 20, 20 1/4, 20 1/2, 21, 21 1/4, 21 1/2, 22, 22 1/4, 22 1/2, 23, 23 1/4, 23 1/2, 24, 24 1/4, 24 1/2, 25, 25 1/4, 25 1/2, 26, 26 1/4, 26 1/2, 27, 27 1/4, 27 1/2, 28, 28 1/4, 28 1/2, 29, 29 1/4, 29 1/2, 30, 30 1/4, 30 1/2, 31, 31 1/4, 31 1/2, 32, 32 1/4, 32 1/2, 33, 33 1/4, 33 1/2, 34, 34 1/4, 34 1/2, 35, 35 1/4, 35 1/2, 36, 36 1/4, 36 1/2, 37, 37 1/4, 37 1/2, 38, 38 1/4, 38 1/2, 39, 39 1/4, 39 1/2, 40, 40 1/4, 40 1/2, 41, 41 1/4, 41 1/2, 42, 42 1/4, 42 1/2, 43, 43 1/4, 43 1/2, 44, 44 1/4, 44 1/2, 45, 45 1/4, 45 1/2, 46, 46 1/4, 46 1/2, 47, 47 1/4, 47 1/2, 48, 48 1/4, 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Chalk Lines—See Lines.**Chisels—**

Socket Framing and Firmer	
P. S. & W.	
New Haven.	
Wetherby.	75¢10¢75¢10¢25¢
Mix.	
Ohio Tool Co.	75¢75¢5¢
Douglas.	
Buck Bros.	30¢
Merrill.	60¢10¢60¢10¢25¢
L. & J. White.	30¢30¢25¢

Tanged and Miscellaneous.

Tanged Firmer.	50¢50¢10¢
Butcher's.	47¢50¢50¢
Spur & Jackson's.	50¢ to 2
Buck Bros.	30¢
Cold Chisels.	15¢16¢

Chucks—

Beach Pat.	each, \$8.00.	20¢
Morse's Adjustable.	each, \$7.00, 20¢20¢5¢	
Danbury.	each, \$8.00, 30¢30¢5¢	
Syracuse, Hals Pat.		25¢
Graham Patent.		33¢45¢
Combination Lathe Chucks.		33¢45¢
Universal Lathe Chucks.		40¢
Independent Lathe Chucks.		40¢
Drill Chucks.		15¢
Union Mfg. Co.		
Victor.	\$8.50, 25¢	
Combination.		40¢
Universal.		40¢
Independent.		40¢

Churns—

Tim Union, each, 5 gal.	\$3.25; 7 gal.	\$2.75; 10 gal.	\$4.25.
McDonald Star Barrel Churn, each	6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.		

Clamps—

A. L. Tool Co.'s Wrought Iron.....	25¢
Adjustable, Cincinnati.....	15¢10¢
Adjustable, Hammers.....	15¢15¢5¢
Adjustable, Stearn's.....	30¢30¢10¢
Stearns' Adjustable Cabinet and Cor- ner.....	30¢30¢10¢
Cabinet, Sargent's.....	70¢10¢
Carriage Makers' Sargent's.....	75¢75¢5¢
Carriage Makers', P. S. & W. Co.....	40¢10¢
Eberhard Mfg. Co.....	40¢5¢40¢10¢
Warner's.....	40¢10¢40¢10¢5¢
Saw Clamps, see Vises, Saw Filers.	
Carpenter's, Cincinnati.....	25¢10¢
Barnes' Machinists' Clamps.....	33¢45¢

Cleavers, Butchers'—

Bradley's.	25¢30¢
L. & J. White.	20¢5¢
Beatty's.	40¢40¢5¢
New Haven Edge Tool Co.'s.	40¢
P. S. & W.	33¢45¢33¢45¢10¢
Poster Bros.	30¢
Schulte, Lohoff & Co.	40¢40¢5¢

Clips—

Norway, Axle, 1/4 & 5-16.	55¢55¢5¢
2d grade Norway, Axle, 1/4 & 5-16.	60¢55¢70¢
Superior Axle Clips.	60¢55¢70¢
Norway Spring Bar Clips, 5-16.	80¢55¢5¢
Wrought Iron Felice Clips.	5¢ D, 5¢
Steel Felice Clips.	5¢ D, 5¢
Baker Axle Clips.	25¢

Cloth and Netting, Wire

—See Wire, etc.

Cockeyes.

Hardware list.	60¢25¢
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Coffee Mills—See Mills, Coffee.**Collars, Dog—**

Chapman Mfg. Company.	50¢10¢60¢
Medford Fancy Goods Co.	40¢10¢50¢
Embossed, Gift, Pope & Steven's list.	30¢15¢
Leather, Pope & Steven's list.	40¢
Brass, Pope & Steven's list.	40¢

Combs, Curry—

Combs, Curry—	
Fitch's.	50¢10¢50¢10¢10¢
Rubber, per doz.	\$10.00.....25¢
American Curry Comb Co.	33¢40¢
Kohler's Magic Oscillating.	5¢ doz., \$2.00

Compasses, Dividers, &c.

Compasses, Callipers, Dividers.	70¢70¢10¢
Bemis & Call Co's	
Dividers.	65¢
Compasses.	60¢5¢
Callipers, Wing and Inside or Outside.	60¢5¢

Callipers, Double.

Callipers, Call's Patent Inside.	30¢
Excelsior.	50¢
J. Stevens & Co.'s.	25¢10¢
Starrett's	
Spring Callipers and Dividers.	25¢10¢
Lock Callipers and Dividers.	25¢
Combination Dividers.	25¢

Coolers, Water—

S. & Co.: 2-gal., \$2.30; 3-gal., \$2.60;	
4-gal., \$3.00; 6-gal., \$3.75 each.	33¢45¢

Coopers' Tools—

—See Tools, Coopers'.

Cord—**Sash—**

Common.	5¢ D, 9¢10¢
Patent, good quality.	5¢ D, 11¢12¢
White Cotton Braided, fair.	5¢ D, 9¢40¢5¢
Common Russia Sash.	5¢ D, 12¢13¢
Patent Russia Sash.	5¢ D, 13¢14¢
Cable Laid Italian Sash.	5¢ D, 19¢20¢
India Cable Laid Sash.	5¢ D, 11¢12¢
Silver Lake.	
A quality, White, 50¢	25¢
A quality, Drab, 50¢	25¢
B quality, White, 30¢	10¢
B quality, Drab, 30¢	10¢
Sylvan Spring, Extra Braided, White.	34¢
Sylvan Spring, Extra Braided, Drab.	30¢
Semper Idem, Braided, White.	37¢28¢
Egyptian, India Hemp, Braided.	30¢
Massachusetts, White.	30¢

Samson—

Braided, White Cotton.	5¢ D, 37¢
Braided, Drab Cotton.	5¢ D, 42¢
Braided, Italian Hemp.	5¢ D, 40¢
Braided, Linen.	5¢ D, 66¢

Tale's Solid Braided—

Hercules, White.	5¢ D, 25¢
Hercules, Drab.	5¢ D, 30¢
Economy, Drab.	5¢ D, 27¢
Economy, White.	5¢ D, 22¢

Osseway Mills—

Braided, Giant, White, 5¢ D, 30¢	30¢
Braided, Giant, Drab and Fancy.	5¢ D

Wire Picture—

Braided or Twisted.	80¢5¢80¢15¢
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Corkscrews—See Screws, Cork.**Corn Knives and Cutters**

—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern, 5¢ doz., \$2.00.	10¢
Turner & Seymour Mfg. Co.	50¢50¢
Acme.	
Japanned, 5¢ gro., \$30	50¢
Nickel Plated, 5¢ gro., \$30.	10¢

Cradles—

Grain.	50¢5¢2¢50¢10¢2¢
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Crayons—

White Crayons, 5¢ gross.	7¢8¢
D. M. Stewart Mfg. Co., Metal Work-	
ers', 5¢ gross, \$2.50.	25¢
D. M. Stewart Mfg. Co., Rolling Mill.	
5¢ gross, \$2.50.	25¢
See also Chalk.	

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curry Combs—**

—See Combs, Curry.

Curtain Pins—

—See Pins, Curtain.

Cutters—**Meat—**

Dixon's, 5¢ doz.	40¢25¢
Nos. 1 2 3 4	
\$14.00 \$17.00 \$19.00 \$20.00	
Woodruff's, 5¢ doz.	40¢25¢
Nos. 1 2 3 4	
\$15.00 \$18.00	

Hale's Pattern, 5¢ doz.

Nos. 11 12 13	
\$27.00 \$33.00 \$45.00	

American.

Nos. 1 2 3 4 5	
Each, \$5 \$7 \$10 \$25 \$30 \$40	
Enterprise.	25¢
Nos. 10 12 22 32 42	
Each, \$2.50 \$4 \$6 \$15	
Great American Meat Cutter.	30¢30¢5¢
Nos. 112 116 118 120 122	
Each, \$2.00 \$2.75 \$3.50 \$4.00	
Miles' Challenge, 5¢ doz.	45¢45¢10¢
Nos. 1 2 3	
\$22.00 \$30.00 \$40.00	
Home No. 1, 5¢ doz., \$30.00.	55¢10¢
Draw Cut, each:	
Nos. 5 6 8	
\$50 \$75 \$90 \$225.	20¢25¢
Beef Shavers (Enterprise).	30¢
Little Giant (P. S. & W. Co.).	50¢
Chadborn's Smoked Beef Cutter, 5¢ doz.,	60¢00

Tobacco

Champion.	20¢10¢30¢
All Iron.	5¢ doz., \$4.25
Nashua Lock Co.'s.	5¢ doz., \$18.00, 50¢55¢
Wilson's.	5¢ doz., \$24.00, 55¢10
Sargent's.	5¢ doz., \$20.00, 40¢
Acme.	5¢ doz., \$20.00, 40¢

Washer—

Smith's Pat.	5¢ doz., \$12.00, 20¢10¢10¢
Johnson's.	5¢ doz., \$11.00, 33¢45¢
Penny's.	5¢ doz., Pol. \$14; Jap'd, \$16, 55¢
Appleton's.	5¢ doz., \$16.00, 60¢10¢
Bonney's.	5¢ doz., \$16.00, 60¢10¢
Cincinnati.	25¢10¢

Dampers, &c.—

Dampers, Buffalo.	40¢10¢
Buffalo Damper Clips.	40¢10¢
Crown Damper.	40¢
Excelsior.	40¢10¢

Diggers, Post Hole, &c.—

Samson, 5¢ doz., \$34.00.	25¢25¢10¢	
Fletcher Post Hole Augers, 5¢ doz., \$36.00,	30¢20¢10¢	
Eureka Diggers.	5¢ doz., \$12.00, 40¢10¢	
Vaughan's Post Hole Auger, 5¢ doz.,	\$8.50, \$9.50	
Kohler's Little Giant.	5¢ doz., \$18.00	
Kohler's Hercules.	5¢ doz., \$18.00	
Kohler's Invincible.	5¢ doz., \$12.00	
Kohler's New Champion.	5¢ doz., \$12.00	
Scheidler.	5¢ doz., \$18.00	
Chenck's Post Bars, 5¢ doz., \$18.00,	60¢5¢60¢10¢	
Gibbs' Post Hole Digger.	5¢ doz., \$15.00	
Gibbs' National.	5¢ doz., \$12.00	
Gibbs' Columbia.	5¢ doz., \$13.00	
Gibbs' Imperial.	5¢ doz., \$7.50	
Shimer's Hollow Handle.	5¢ doz., \$24.00,	50¢

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Springs—**

—See Springs, Door.

Drawers.

Money, 5¢ doz.	\$12¢\$20
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Drawing Knives—

—See Knives, Drawing.

Drills and Drill Stocks

Blacksmith's.	each \$1.75
Blacksmith's Self-Feeding, each \$7.50, 20¢	
Ernest, P. S. & W.	40¢10¢
Breast, Wilson's.	20¢25¢
Breast, Bartholomew's.	each \$2.50
Ratchet, Merrill's.	25¢10¢40¢
Ratchet, Ingersoll's.	20¢20¢5¢
Ratchet, Parker's.	20¢20¢5¢
Ratchet, Whitney's.	20¢10¢
Ratchet, Weston's.	20¢20¢
Ratchet, Moore's Triple Action.	25¢30¢
Ratchet, Curtis & Curtis.	30¢
Whitney's Hand Drill, Plain, \$11.00,	
Adjustable, \$12.00.	30¢10¢
Automatic Boring Tools.	\$1.75, \$1.85
Chicopee Automatic Drill.	50¢10¢

Twist Drills—

Cleveland.	60¢10¢10¢
Diamond, W. & B.	50¢10¢10¢
Graham's Pat. Groove Shank.	50¢10¢10¢
Morse.	50¢10¢10¢
New Process.	50¢10¢10¢
Standard.	60¢10¢10¢
Syracuse (Meta list).	50¢10¢

Drill Bits or Bit Stock

—See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

—See Pans, Dripping.

Drivers, Screw—

Douglas Mfg. Co.	20¢20¢10¢	
Diaston's.	50¢	
Buck Bros.	30¢	
Stanley R. & L. Co.'s		
No. 64, Varished Handles.	65¢10¢	
No. 86.	70¢10¢	
Sargent & Co.'s		
No. 1, Forged Blade.	60¢10¢10¢	
Nos. 20, 40 and 60.	60¢10¢10¢	
P. S. & W.	70¢	
Knapp & Cowles		
No. 1.	60¢20¢70¢	
No. 2.	60¢10¢10¢70¢5¢	
No. 3.	60¢5¢60¢10¢	
Nos. 4 and 60, Acme and Ideal.	50¢50¢	
Stearns.	50¢10¢5¢	
Gay & Parsons.	25¢10¢5¢	
Champion.	25¢10¢	
Clark's Pat.	30¢33¢	
Crawford's Adjustable.	30¢	
Elirich's Socket and Ratchet.	20¢30¢10¢	
Allard's Spiral, new list.	25¢	
Kohl's Common Sense.	5¢ doz., \$6.00,	25¢10¢
Syracuse Screw Driver Bits.	50¢ doz., 50¢75¢	
Screw Driver Bits, Parr's.	5¢ gross, \$6.25	
Fray's Hot, H'dle Sets.	No. 5, \$12.00, 45¢	
P. D. & Co.'s All Steel.	50¢	
Cincinnati.	25¢10¢	
Brace Screw Drivers.	25¢10¢	
Buck Bros' Screw Driver Bits.	27¢45¢	
Goodell's Automatic.	50¢	
Mayhew's Black Handle.	45¢10¢	
Mayhew's Monarch.	45¢10¢	
C. T. Williamson Wire Novelty Co.	50¢	

Egg Beaters—See Beaters, Egg**Egg Poachers—**

—See Poachers, Egg.

Electric Bell Sets—

—See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF.

46 gr.	150 gr.	F.F.F.
Kegs, 5¢ D.	45¢ 5¢	24¢
1/4 kegs, 5¢ D.	45¢ 5¢	24¢
1/2 kegs, 5¢ D.	5¢ 5¢	3¢
10-1/2 cans, 10		
In case.	6¢ 6¢	5¢
10-1/2 cans, less	than 10.	10¢ 10¢ 7¢

Enameled and Tinned

—See Ware, Hollow.

Escutcheon Pins—

—See Pins, Escutcheon.

Escutcheons—

Door Lock.	Same dis. as Door Locks.
Brass Thread.	60¢60¢10¢
Wood.	25¢

Expanded Metal—

List No. 5.	
Lathing.	10¢
Fencing, Painted Sheets.	20¢
Netting, Painted Sheets.	20¢
Door Mats, Galvanized.	25¢
Window Guards, Paneled.	15¢
Tree Guards, Paneled.	15¢

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Mackrell's, 5¢ doz., \$1.00.	20¢20¢10¢
Van Sand's Screw Pat. \$15 5¢ gr.	60¢10¢
Van Sand's Old Pat. \$15 5¢ gr.	55¢10¢
Austin & Eddy No. 2008.	5¢ gr., \$9.00
Self Gravity.	5¢ gr., \$9.00
Zimmerman's.	50¢10¢

Faucets—

Fenn's.	40¢
F	

Halters—

Covert's Rope, Jute.....	60¢10¢10¢25¢
Covert's Rope, 7-16-in. Jute.....	70¢25¢
Covert's Rope, 1/2-in. Hemp.....	50¢25¢
Covert's Ad. Rope Halters.....	40¢25¢
Covert's Hemp Horse and Cattle Tie.....	50¢10¢25¢
Covert's Jute Horse Ties.....	70¢25¢
Covert's Jute Cattle Ties.....	70¢10¢25¢
Covert's Ad. Web Halters.....	35¢25¢
Covert's Saddlery Works Halters.....	35¢25¢
Covert's Saddlery Works Horse and Cattle Ties.....	35¢25¢

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....	35¢10¢35¢
Buffalo Hammer Co.....	50¢10¢
Humason & Beckley.....	50¢10¢
Atha Tool Co.....	50¢10¢
Verree.....	40¢10¢
O. Hammond & Son.....	40¢10¢
Fayette R. Plumb.....	40¢10¢
Artisan's Choice, A. E. Nail.....	40¢10¢
Regular Y. & E. Nail.....	50¢
Horsehoe Turning Hammers.....	50¢
Other Hammers.....	50¢10¢
Cheney's Claw.....	40¢10¢
Cheney's Machinist's & Hiveting.....	50¢5¢
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....	40¢10¢
Nelson Tool Works.....	40¢10¢
Warner & Nobles, new list.....	25¢10¢
Peck, Stow & Wilcox.....	35¢40¢
Sargent's.....	40¢40¢10¢

Heavy Hammers and Sledges—

\$ 3 and under.....	75¢10¢75¢10
\$ 3 to 5.....	25¢
Over \$ 5.....	25¢
Wilkinson's Smiths.....	10¢40¢11¢

Handcuffs and Leg Irons

—See Police Goods.

Handles—

Atkins', new list.....	40¢
Champion.....	15¢
My's Perfection.....	50¢, \$3.00

Iron, Wrought or Cast—

Door or Thumb.....	1 2 3 4
Nos.....	1 2 3 4
Per doz.....	\$0.90 1.00 1.08 1.35 1.50
Boggin's Latches.....	50¢80¢35¢
Bronze Iron Drop Latches.....	70¢
Jap'd Store Door Handles—Nuts, \$1.62; Plate, \$1.10; no plate, \$0.88.....	net
Barn Door, per doz \$1.40.....	10¢10¢
Chest and Lifting.....	70¢70¢10¢

Wood—

Saw and Plane.....	40¢10¢50¢
Hammer, Hatchet, Axe, &c.....	40¢40¢25¢
Brad Axl.....	50¢
Hickory Firmer Chisel, ass'd.....	50¢
Hickory Firmer Chisel, large.....	50¢
Apple Firmer Chisel, ass'd.....	50¢
Apple Firmer Chisel, large.....	50¢
Socket Firmer Chisel, ass'd.....	50¢
Socket Framing Chisel, ass'd.....	50¢
J. B. Smith & Co.'s Pat. File.....	50¢
File, assorted.....	50¢
Auger, assorted.....	50¢
Auger, large.....	50¢
Pat. Auger, Ives'.....	30¢10¢
Pat. Auger, Swain.....	50¢
Pat. Auger, Swain.....	50¢
Hoe, Rake, Shovel, &c.....	60¢60¢25¢

Hangers—

Barn Door, old patterns.....	70¢70¢15¢
Barn Door, New England.....	70¢70¢15¢
Samson Steel Anti-Friction.....	50¢
Orleans Steel.....	55¢
Hamilton Wrought Steel Track.....	55¢
Champion.....	60¢10¢
Climax Anti-Friction.....	55¢
Zenith for Wood Track.....	55¢
Victor, No. 1, \$18.00; No. 2, \$16.50; No. 3, \$15.00.....	50¢25¢
Kidder's.....	50¢50¢10¢
Boss.....	60¢10¢60¢10¢5¢
Best Anti-Friction.....	60¢10¢60¢10¢5¢
Duplex (Wood Track).....	60¢10¢5¢
Terry's Modern.....	50¢10¢50¢10¢5¢
Terry's Ideal.....	50¢10¢50¢10¢5¢
Terry's Solid.....	50¢10¢60¢
Terry's Shield.....	50¢10¢60¢
Terry's Wrought Single Strap.....	50¢10¢
Cronk's Patent, Steel Covered.....	50¢10¢
Carrier Steel Anti-Friction.....	50¢10¢
Richards'.....	30¢50¢10¢
Lane's New Standard.....	50¢50¢10¢
Lane's Standard.....	50¢50¢10¢
Lane's Parlor.....	40¢
Warner's Pat.....	20¢10¢10¢
Stearns' Anti-Friction.....	20¢10¢10¢
Stearns' Challenge.....	25¢10¢10¢
Cincinnati, Nos. 1, \$3.25; 2, \$2.50; 4, \$2.50.....	20¢10¢
Paragon, Nos. 5, 5 1/2, 7 and 8.....	20¢10¢
Prescent.....	60¢60¢10¢
Nickel Steel, Nos. 0, \$36; 1, \$20; 2, \$16.....	40¢10¢50¢
Chicago Anti-Friction.....	30¢10¢
Star.....	40¢10¢40¢10¢25¢
Barry.....	50¢10¢
Interstate.....	50¢10¢
Pendulum, Payson's.....	40¢40¢10¢
Woody.....	45¢
Economy, \$6.00.....	50¢10¢
Perfection.....	50¢10¢50¢10¢25¢

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.....	40 & 10 & 50 & 55
Blood's.....	40 & 10 & 50 & 55
Hunt's.....	40 & 10 & 50 & 55
Hurd's.....	40 & 10 & 50 & 55
Mann's.....	40 & 10 & 50 & 55
Peck's.....	40 & 10 & 50 & 55
Underhill's.....	40 & 10 & 50 & 55
Buffalo Hammer Co.....	40 & 10 & 50 & 55
Fayette R. Plumb.....	40 & 10 & 50 & 55
C. Hammond & Son.....	40 & 10 & 50 & 55
Kelly's.....	40 & 10 & 50 & 55
Sargent's & Co.....	40 & 10 & 50 & 55
P. S. & W. Co.....	40 & 10 & 50 & 55
Ten Eyck Edge Tool Co.....	40 & 10 & 50 & 55
Collins.....	40 & 10 & 50 & 55
Schultz, Loboff & Co.....	40 & 10 & 50 & 55

Hay and Straw Knives—

See Knives.

Hinges—

Blind Hinges—

Parker.....	75¢25¢
Huber.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 60.....	80¢80¢25¢
Clark's Mortise Gravity.....	50¢
Sargent's, Nos. 1, 3, 5, 11, 12, 13, 75¢10¢	75¢10¢
Reading's Gravity.....	75¢10¢75¢10¢25¢
Shepard's.....	75¢10¢
Noiseless.....	75¢10¢
Niagara.....	80¢
Buffalo.....	80¢
Clark's Genuine Pattern.....	80¢
O. S., Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢
Queen City Reversible.....	70¢10¢25¢
Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 3 1/2, 5.....	75¢10¢25¢
North's Automatic Blind Hinges, No. 2 for Wood, \$0.00; No. 3, for Brick, \$1.50.....	10¢

Gate Hinges—

Western.....	50¢40¢, 60¢80¢10¢
N. E. Reversible.....	50¢70¢, 60¢80¢10¢
Clark's, Nos. 1, 2, 3.....	60¢80¢10¢
N. Y. State.....	50¢40¢, 60¢80¢10¢
Automatic.....	50¢12.50, 50¢
Shepard's.....	60¢10¢25¢

Spring Hinges—

Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s list.....	20¢
March, 1886.....	20¢
Barker's Double Acting.....	25¢
Union Mfg. Co.....	25¢
Bommer's.....	30¢
Buckman's.....	15¢20¢
Chicago.....	30¢
Bardley's Patent Checking.....	15¢
Acme.....	30¢
U. S.....	25¢10¢
Empire and Crown.....	20¢
Hero and Monarch.....	55¢
American, Gem and Star.....	20¢
Oxford.....	30¢
Royal.....	60¢
Reliable.....	60¢
Champion.....	60¢
No. 10 Matchless.....	60¢
No. 25 Unbreakable.....	60¢
J. G. Covered, per gro.....	50¢25¢
Samson.....	50¢
Wiles', No. 1, per gro.....	15¢
Devore, No. 1.....	15¢
Rex.....	15¢
Freeport.....	15¢
New Idea Nos. 1 and 10.....	15¢
Ideal No. 3.....	15¢
Stearns' Noiseless Floor Hinge, per set, \$5.00.....	20¢10¢30¢

Wrought Iron Hinges—

List February 14, 1891.....	50¢10¢50¢10¢45¢
Strap and T.....	50¢10¢50¢10¢45¢
Corrugated Strap and T.....	50¢10¢50¢10¢45¢
Screw Hook and Strap.....	50¢10¢50¢10¢45¢
Screw Hook and Eye.....	50¢10¢50¢10¢45¢
Roller Blind Hinges, Nos. 33 and 34.....	50¢10¢
Roller Blind Hinges, Nos. 232 and 234.....	50¢10¢
Roller Plate.....	70¢10¢
Roller Raised.....	70¢10¢
Plate Hinges.....	70¢10¢
"Providence" over 12 in.....	50¢

Hoes—

D. & H. Scovill.....	20¢
Lane's Crescent, Planters' Pattern.....	45¢25¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢25¢
Sandusky Tool Co., S. & O. Pat.....	70¢70¢
Am. Axe and Tool Co., S. & O.....	5¢
Chattanooga Tool Co., S. & O. Pat.....	60¢
Grab.....	50¢10¢

Handled—

Garden, Mortar, &c.....	70¢70¢50¢25¢
Planter's, Cotton, &c.....	70¢70¢50¢25¢
Warren Hoe.....	60¢60¢50¢
Magic.....	60¢60¢

Hog Rings and Ringers—

See Rings and Ringers.

Hoisting Apparatus—

See Machines, Hoisting.

Hollow-Ware—

See Ware, Hollow.

Holders—

Bag.....	50¢
Sprengle's Pat.....	50¢18.....60¢
Bit.....	50¢
Extension.....	50¢
Barber's.....	50¢15.....40¢40¢10¢
Ives.....	50¢20.....40¢50¢10¢
Diagonal.....	50¢20.....40¢50¢10¢
Angular.....	50¢20.....40¢50¢10¢

File and Tool—

Rals Pat.....	50¢40.....35¢
Nicholson File Holders.....	35¢

Sash—

Motley's Adj. Sash, Medium Size.....	40¢
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Hooks—

Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢

Cast Iron—

Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢

Clothes Line, Reading list.

Ceiling, Sargent's list.....	55¢10¢10¢
Harness, Reading list.....	55¢10¢10¢
Coat and Hat, Sargent's list.....	55¢10¢10¢

Wrought Iron—

Cotton.....	50¢10¢10¢
Cotton Pat. (N. Y. Mallet and Handle).....	50¢10¢10¢
Wks.....	50¢10¢10¢
Tassel and Picture, T. & S. Mfg. Co.....	50¢10¢10¢
Wrought Staples, Hooks, &c.....	50¢10¢10¢

Wire—

Wire Coat and Hat, Gem, list April, 1886.....	60¢60¢10
Wire Coat and Hat, Miles, list April, 1886.....	60¢60¢10
Indestructible Coat and Hat.....	45¢45¢55¢
Wire Coat and Hat, Standard.....	60¢60¢10
Handy Hat and Coat.....	50¢10¢60¢
Steady Ceiling Hooks.....	50¢10¢60¢
Belit.....	80¢15¢80¢20¢
Atlas, Coat and Hat.....	60¢
Williamson's Bird Cage Hooks, list April, 1892.....	40¢
Bright Wire Goods—See Wire.	

Miscellaneous—

Grass, No. 2, \$3.00; No. 3, \$2.10; No. 4, \$2.25.....	50¢
Nolin's Grass.....	50¢
Bush.....	55¢60¢
Whiffletree—Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	50¢
Bench Hooks—See Bench Stops.	

Horse Nails—See Nails, Horse.

Horse Shoes—

See Shoes, Horse.

Hose, Rubber—

Competition.....	75¢75¢10¢5¢
Standard.....	60¢10¢10¢70¢10¢
Extra.....	60¢60¢10¢
N. Y. B. & P. Co., Extra.....	40¢40¢25¢
N. Y. B. & P. Co., Dundee.....	50¢10¢60¢

Huskers—

Blair's Adjustable.....	50¢
Blair's Adjustable Clipper.....	70¢
Hubbard's Solid Steel.....	45¢

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Iron.

Sad—

From 4 to 10, at factory.....	100¢
Self-Heating.....	25¢30¢42¢40
Self-Heating Tailors'.....	50¢
Enterprise Irons, list Jan. 17, 1893.....	30¢
Enterprise Star Irons, list Jan. 17, '93.....	30¢
Crown.....	60¢10¢60¢10¢5¢
Ideal Irons, new list.....	50¢10¢50¢10¢10¢
Samander Irons.....	25¢
R. B. Sad Irons.....	50¢
Chinese Laundry (N.E. But Co.).....	15¢
New England.....	50¢20¢20¢5¢
Mahony's Troy Pol. Irons.....	25¢
Sensible, list Jan. 91.....	50¢10¢5¢
Sensible Tailor's Irons.....	33¢
National Self-Heating.....	30¢

Soldering—

Soldering Coppers.....	10¢10¢21¢
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
Tinker's Dread.....	50¢1.75; per gro. 1.18

Pinking—

Pinking Irons, per doz., 55¢60¢.

Jack Screws—See Screws.

Jacks, Wagon—

Daisy.....	33¢45¢
Victor.....	33¢45¢
Lockport.....	40¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91.....	25¢25¢
Brass, Spun, Pld. W.M. list Jan. 1, '91.....	20¢
Stamped Brass Kettles.....	21¢
Enameled and Tea—See Ware, Hollow.	

Keys—

Lock, Ass'n list Dec. 30, 1890.....	65¢10¢70¢
Eagle, Cabinet, &c.....	33¢42¢
Hotchkiss' Brass Blanks.....	40¢
Hotchkiss' Copper and Tinned.....	40¢
Hotchkiss' Pad and Cab.....	35¢
Wollensak Tinned.....	50¢10¢

Knife Sharpeners—

See Sharpeners, Knife.

Knives—

Butcher, Shoe, &c.	
Wilson's Butcher Knives, list Dec 8, 1890.....	25%
Ames' Butcher Knives.....	25%
Foster Bros.' Butcher, &c.....	40%
Jordan's Aa Al Butchers', list.....	40%10%
Nichols' Butcher Knives.....	40%10%
W. W. Wilson, Butcher, 6 in.....	\$3.00; 7 in., \$2.70; 8 in., \$3.80, &c.
Ames' Butcher Knives.....	\$3.00; 25%
Ames' Brod Knives.....	\$1.15; 20%
Moran's Shoe and Bread.....	20%20&10%
Hay and Straw—See Hay Knives.	
Table and Pocket—See Cutlery.	

Tubular Steel # doz \$24.00 40-25
(Lots of 6 doz 50¢)

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)..... 65¢
 Hitch's (Bristol)..... 50¢10¢
 Kitchins..... 10¢
 Andrews..... 50¢
 Sargent's Patent Guarded..... 70¢10¢10¢
 German, new list..... 40¢10¢
 Covert..... 50¢10¢25¢
 Covert, New Patent..... 50¢10¢25¢
 Covert, New E. E..... 50¢10¢25¢
 Covert Spring..... 50¢10¢10¢
 Covert's Saddlery Works' Triumph..... 33¢
 John Prots Snaps..... 75¢75¢25¢

Snaths. Scythe-

Lat..... 50¢50¢25¢

Soldering Irons-

See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberglass-

Cuspidors, 8½-inch, ½ doz. No. 5, 3; No. 5, 2, 30.

Spittoons, Daisy, 2-inch, No. 1, 4; 10 and 11 inch, 30.

Spoke Shaves-

See Shaves, Spoke.

Spoke Trimmers-

See Trimmers, Spoke.

Spoons and Forks-

Tinned Iron-

Beating, Cen. Stamp. Co.'s list..... 70¢10¢

Solid Table and Tea, Cen. Stamp. Co.'s list..... 70¢10¢

Buffalo, S. S. & Co..... 33¢42¢

Silver Plated-

months or 5¢ cash 30 days:

Meriden Brit. Co., Rogers..... 40¢15¢

C. Rogers & Bros..... 40¢15¢

Rogers & Bros..... 40¢15¢

Reed & Barton..... 40¢40¢25¢

Wm. Rogers Mfg. Co..... 40, 15¢25¢

Simpson, Hall, Miller & Co..... 40, 15¢25¢

Holmes & Edwards Silver Co..... 40, 15¢25¢

L. Boardman & Son..... 50¢13¢45¢

Miscellaneous-

Holmes & Edwards Silver Co..... 50¢10¢25¢

No. 67 Mexican Silver..... 50¢10¢25¢

No. 90 Silver Metal..... 50¢10¢25¢

No. 94 German Silver..... 50¢10¢25¢

No. 50 Nickel Silver..... 50¢10¢25¢

No. 49 Nickel Silver..... 50¢10¢25¢

Wm. Rogers Mfg. Co..... 50¢10¢25¢

Rogers' Silver Metal..... 50¢10¢25¢

18¢ Rogers' German Silver..... 50¢10¢25¢

23¢ Rogers' Nickel Silver..... 50¢10¢25¢

German Silver..... 50¢10¢25¢

German Silver, Hall & Elton..... 50¢25¢ cash

Nickel Silver..... 50¢25¢50¢10¢25¢ cash

Britannia..... 50¢60¢25¢

Boardman's Nickel Silver, list July 1, 1891..... 50¢75¢25¢

Boardman's Britannia Spoons, case lots..... 50¢25¢ cash

Spring-

Door-

Torrey's Rod, 30 in..... ½ doz \$1.50@1.5

Warner's No. 1, ½ doz \$1.50; No. 2, \$3.40..... ½ doz \$1.50; No. 2, \$3.40

Star (Coll), list April 19, 1888..... 20¢10¢

Star (Coll), list April 19, 1888..... 20¢10¢

Victor (Coll)..... 60¢10¢60¢10¢25¢

Champion (Coll)..... 60¢10¢60¢10¢25¢

Cowell's, No. 1, ½ doz \$1.00; No. 2, \$1.50..... 50¢60¢25¢

Hubber, complete, ½ doz \$4.50..... 50¢10¢

Phoenix..... 50¢10¢25¢

Carriage, Wagon, &c.

Millett, Concord, Platform and Half

Scroll..... 60¢10¢40¢10¢10¢ or net prices

Chin's Bolster Springs..... 25¢

Squares-

Steel and Iron..... 80¢10¢10¢90¢25¢

Nickel Plated..... 60¢10¢10¢

Try Square and T Bevels..... 60¢10¢10¢

Diston's Try Square and T Bevels..... 50¢

Winterbottom's Try and Miter..... 50¢

Starrett's Micrometer Caliper Squares..... 25¢

Avery's Flush Bevel Squares..... 40¢

Avery's Bevel Protractor..... 50¢

Squeezers-

Fodder-

Blair's..... ½ doz \$2.00

Blair's "Climax"..... ½ doz \$1.25

Lemon-

orcelain Lined, No. 1..... ½ doz \$5.00

Wood, No. 2..... ½ doz \$3.00, 35¢

Wood, Common..... ½ doz \$1.70@1.75

Dunlap's Improved..... ½ doz \$3.75, 20¢

Sammis, No. 1, \$5.00; No. 2, \$4.15..... ½ doz \$3.75, 20¢

Jennings' Star..... ½ doz \$2.50

The Boss..... ½ doz \$2.50

Dean's, Nos. 1, ½ doz \$0.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50

Little Giant..... 50¢50¢25¢

King..... 40¢25¢

Hotchkiss Straight Flash..... ½ doz \$12.00

Silver & Co., Glass..... ½ doz \$9.00

Standard Fiber Ware-

See Ware, Standard Fiber.

Staples-

Barbed Wire, ¼ in. and larger, ½ doz \$7.75

Barbed Wire, ¼ in. and larger, ½ doz \$7.75

Fence Staples, Galvanized, ½ doz \$7.75

Fence Staples, Plain, ½ doz \$7.75

Grand Crossing Tack Co.'s list..... 75¢10¢

Steelyards

40¢10¢50¢

Stocks and Dies-

Blacksmith's:

Waterford Goods..... 35¢

Butterfield's Goods..... 35¢

Lightning Screw Plate..... 35¢

Revere's New Screw Plates..... 35¢

Reversible Ratchet..... 30¢

Gardner..... 25¢

Green River..... 25¢

Stops, Bench-

Merrill's, ½ doz, No. 1, \$9.50; 2, \$12.00

Hotchkiss's..... ½ doz \$5, 10¢10¢10¢

Weston's, No. 1, \$10, No. 2, \$4, 25¢10¢25¢

McGill's, ½ doz \$3..... 10¢

Cincinnati..... 25¢10¢

Terrell's Nos. 1 and 2, ½ doz, \$3; No. 3, \$3.00..... 30¢

Stone-

Stones, Grind-See Grindstones.

Scythe Stones-

Pike Mfg. Co., list April, 1892..... 33¢45¢

Cleveland Stone Co., list Nov. 1892..... 33¢45¢

Oil Stones, &c.

Pike Mfg. Co.:

Hindustani No. 1, ½ doz..... 50¢

Sand Stone..... 40¢40¢

Turkey Oil Stone, 4 to 8 in..... 10¢

Washita Stone, No. 1..... 40¢

Washita Stone, No. 2..... 40¢

Washita Stone, No. 3..... 40¢

Washita Stone, No. 4..... 40¢

Washita Stone, No. 5..... 40¢

Washita Stone, No. 6..... 40¢

Washita Stone, No. 7..... 40¢

Washita Stone, No. 8..... 40¢

Washita Stone, No. 9..... 40¢

Washita Stone, No. 10..... 40¢

Washita Stone, No. 11..... 40¢

Washita Stone, No. 12..... 40¢

Washita Stone, No. 13..... 40¢

Washita Stone, No. 14..... 40¢

Washita Stone, No. 15..... 40¢

Washita Stone, No. 16..... 40¢

Washita Stone, No. 17..... 40¢

Washita Stone, No. 18..... 40¢

Washita Stone, No. 19..... 40¢

Washita Stone, No. 20..... 40¢

Washita Stone, No. 21..... 40¢

Washita Stone, No. 22..... 40¢

Washita Stone, No. 23..... 40¢

Washita Stone, No. 24..... 40¢

Washita Stone, No. 25..... 40¢

Washita Stone, No. 26..... 40¢

Washita Stone, No. 27..... 40¢

Washita Stone, No. 28..... 40¢

Washita Stone, No. 29..... 40¢

Washita Stone, No. 30..... 40¢

Washita Stone, No. 31..... 40¢

Washita Stone, No. 32..... 40¢

Washita Stone, No. 33..... 40¢

Washita Stone, No. 34..... 40¢

Washita Stone, No. 35..... 40¢

Washita Stone, No. 36..... 40¢

Washita Stone, No. 37..... 40¢

Washita Stone, No. 38..... 40¢

Washita Stone, No. 39..... 40¢

Washita Stone, No. 40..... 40¢

Washita Stone, No. 41..... 40¢

Washita Stone, No. 42..... 40¢

Washita Stone, No. 43..... 40¢

Washita Stone, No. 44..... 40¢

Washita Stone, No. 45..... 40¢

Washita Stone, No. 46..... 40¢

Washita Stone, No. 47..... 40¢

Washita Stone, No. 48..... 40¢

Washita Stone, No. 49..... 40¢

Washita Stone, No. 50..... 40¢

Washita Stone, No. 51..... 40¢

Washita Stone, No. 52..... 40¢

Washita Stone, No. 53..... 40¢

Washita Stone, No. 54..... 40¢

Washita Stone, No. 55..... 40¢

Washita Stone, No. 56..... 40¢

Washita Stone, No. 57..... 40¢

Washita Stone, No. 58..... 40¢

Washita Stone, No. 59..... 40¢

Washita Stone, No. 60..... 40¢

Washita Stone, No. 61..... 40¢

Washita Stone, No. 62..... 40¢

Washita Stone, No. 63..... 40¢

Washita Stone, No. 64..... 40¢

Washita Stone, No. 65..... 40¢

Washita Stone, No. 66..... 40¢

Washita Stone, No. 67..... 40¢

Washita Stone, No. 68..... 40¢

Washita Stone, No. 69..... 40¢

Washita Stone, No. 70..... 40¢

Washita Stone, No. 71..... 40¢

Washita Stone, No. 72..... 40¢

Washita Stone, No. 73..... 40¢

Washita Stone, No. 74..... 40¢

Washita Stone, No. 75..... 40¢

Washita Stone, No. 76..... 40¢

Washita Stone, No. 77..... 40¢

Washita Stone, No. 78..... 40¢

Washita Stone, No. 79..... 40¢

Washita Stone, No. 80..... 40¢

Bill Nye Brad Box..... 4 00

Parisian Gilt Nails, cartoon..... 50¢

Home Tacks, No. 50 ½ case (12 cartons), \$30.00; No. 100, ½ case (12 cartons), \$72.00.

Home Nails, No. 200, ½ case (12 cartons), \$30.00; No. 400, ½ case (12 cartons), \$60.00.

Upholsterers' Nails..... 50¢10¢

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list..... 50¢10¢

See also Nails, Wire.

Tanks, Oil-

Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal. \$11 each..... 50¢10¢

Tapes, Measuring-

American..... 40¢40¢25¢

Spring..... 40¢

Chesterman's, Regular list..... 25¢30¢

Thermometers-

Tin Case..... 80¢80¢10¢

Thimble Skeins-See Skeins.**Ties, Bale-Steel.**

Standard Wire, list..... 50¢10¢25¢

Tinners' Shears, &c.-

See Shears, Tinners' &c.

Tinware-

Stamped, Japanned and Placed, list Jan 20, 1887..... 70¢10¢70¢25¢

Tire Benders, Upsetters, &c.-See Benders and Upsetters, Tire.**Tobacco Cutters-**

See Cutters, Tobacco.

Tools-**Coopers'-**

Bradley's..... 20¢

Barton's..... 30¢40¢25¢

L. & I. J. White..... 30¢25¢

Albertson Mfg. Co..... 25¢

Whips									
American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.	
X. L. Whalebones Driving...	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00	
Sureks, Two-thirds Whalebones...	15.00	16.50	18.00	20.00					
Bull Bone, Half-length Whalebones...			11.00	12.00	13.00	15.00			
American Standard...	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50	
True Grip, Raw Hide Center...	6.00	6.00	6.50	7.00	7.50	8.00			
New Name, Stocked Java, Black and Wine Colors...				6.00					
Americus, 93 Pen Whip...				6.00					
Gents' Light Driving No. 111...				6.00					
Gents' Light Driving No. 106...				5.00					
Hand-made Stocked Java No. 108...				3.75	4.00				
A large variety of cheaper grades...									
Team Whips...									
Toy Whips...									
Hardware Assortment, 10/American, 75 Whips for \$50.00.									

Wire and Wire Goods—									
Iron—									
Market.									
Br. & Ann. Nos. 0 to 15.									
75¢ 10¢ 75¢ 10¢ 25¢									
Cop'd. Nos. 0 to 15. 75¢ 25¢									
Galv. Nos. 0 to 15.									
70¢ 25¢ 70¢ 10¢									
Tin'd. Tin'd list, Nos. 0 to 15.									
70¢ 70¢ 10¢									
Extra 5¢ 10¢ often given prices often made on large lots.									
Stones, Br. and Ann'd, Nos. 16 to 18.									
Bright and Ann'd, Nos. 19 to 26.									
Br. and Ann'd, Nos. 27 to 36.									
Tinned.									
Tinned Broom Wire, 18 to 21.									
Galvanized Fence.									
Brass, list Jan. 18, 1893.									
Copper, list Jan. 18, 1893.									
Ann'd Wire on Spools.									

Malm's An'ded & Tin'd on Spools.	60¢ 25¢
Malm's Brass and Cop. on Spools.	50¢ 25¢
Tate's Spooled, Tin'd & Ann'd.	60¢ 25¢
Tate's Spooled Cop. and Brass.	50¢
Cast Steel Wire.	50¢
Stubs' Steel Wire.	50¢ 00 to 2, 30¢
Steel Music Wire, 12 to 30, imported.	50¢ 70¢
Wire Clothes Line, see Lines.	60¢ 70¢
Wire Picture Cord, see Cord.	
Bright Wire Goods—	
Standard list.	85¢ 85¢ 10¢
Wire Cloth and Netting—	
Painted Screen Cloth, good quality.	100 sq. ft. \$1.40
Galvanized Wire Netting.	75¢ 75¢ 10¢
Wire, Barb—	
See Trade Report.	
Wire Rope—See Rope, Wire.	
Wrenches—	
American Adjustable.	40¢
Baxter's Adjustable "S".	40¢ 10¢ 50¢
Baxter's Diagonal.	60¢
Cox's "Mechanics".	50¢ 10¢ 25¢
Cox's "General".	50¢ 10¢ 25¢
Girard Standard.	65¢ 10¢ 70¢
Lamson & Sessions' Engineers'.	60¢ 10¢
Lamson & Sessions' Standard.	70¢ 10¢
P. S. & W. Agricultural.	
Girard Agricultural.	75¢ 10¢ 30¢
Lamson & Sessions' Agric'l.	
W. & B. Diamond.	

Bemis & Call's:	
Pat. Combination.	60¢
Merrick's Pattern.	25¢
Briggs' Pattern.	25¢
Cylinder or Gas Pipe.	40¢ 25¢
No. 3 Pipe.	50¢
Alken's Pocket (Bright).	50¢ 00, 60¢ 10¢
The Favorite Pocket.	50¢ 00, 60¢ 10¢
Webster's Pat. Combination.	25¢
Boardman's.	25¢
Always Ready.	50¢ 25¢
Alligator.	50¢
Donohue's Engineer.	30¢ 10¢
Eagle.	50¢ 10¢
Acme, Bright.	60¢ 25¢
Acme, Nicked.	60¢ 25¢
Hercules.	70¢ 70¢ 25¢
Walker's.	55¢ 25¢
Diamond Steel.	55¢ 25¢
Cincinnati Brace Wrenches.	55¢ 10¢
Taft's Vise Wrench.	55¢ 10¢ 25¢
Wringers, Clothes—	
Am. Wringer Co.'s list Jan. 2, '93.	25¢ cash
Colby Wringer Co.'s list Sept. 1, '91.	25¢ cash
Lovell Mfg. Co.'s list Jan. 1, 1893.	25¢ cash
Peelless Mfg. Co.'s list Feb. 1893.	25¢ cash
National Wringer & Mfg. Co., list June 1, 1893.	25¢ cash
Wrought Goods—	
Staples, Hooks, &c., list March 17, 1893.	65¢ 10¢ 35¢ 15¢

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.. per gal.	50
Linseed, City, boiled.	55
Linseed, Western.	50
Lard, City, Extra Winter.	81
Lard, City, Prime.	80
Lard, City, Extra No. 1.	70
Lard, City, No. 1.	60
Lard, Western, prime.	80
Cotton-seed, Crude, prime.	42
Cotton-seed, Crude, off grades.	38
Cotton-seed, Summer Yellow, prime.	45
Cotton-seed, Summer Yellow, off grades.	40
Sperm, Natural Spring.	97 1/2
Sperm, Bleached Spring.	97
Sperm, Natural Winter.	1.00
Sperm, Bleached Winter.	1.05
Whale, Crude.	55
Whale, Natural Winter.	55
Whale, Bleached Winter.	55
Whale, Extra Bleached.	50
Sea Elephant, Bleached Winter.	15
Menhaden, Crude, Sound.	40
Menhaden, Crude, Southern.	42
Menhaden, Light Pressed.	42
Menhaden, Extra Bleached.	45
Tallow, City, prime.	60
Tallow, Western, prime.	60
Cocoanut, Ceylon.	64
Cocoanut, Cochinchina.	74
Oil, Domestic.	25
Oil, Foreign.	45
Red Elaine.	44
Red Saponified.	54
Bank.	40
Strait.	41
Olive, Italian, bbls.	63
Neatfoot, prime.	80
Palm, prime, Lagos.	74

Mineral Oils—	
Black, 20 gravity, 25 @ 30 cold test.	7
Black, 20 gravity, 15 cold test.	7 1/2
Black, 20 gravity, summer.	7 1/2
Cylinder, light, filtered.	14

Cylinder, dark, filtered.	10
Paraffine, 23 1/2 @ 24 gravity.	11
Paraffine, 25 gravity.	10
Paraffine, 28 gravity.	7 1/2
Paraffine, red.	14 1/2

Paints and Colors—	
Barytes, Foreign, 2 ton.	\$22.00
Barytes, Amer. doated.	\$20.00
Barytes, Amer. No. 1.	\$16.00
Barytes, Amer. No. 2.	\$15.00
Barytes, Amer. No. 3.	\$12.00
Blue, Celestial.	6
Blue, Chinese.	40
Blue, Prussian.	25
Blue, Ultramarine.	8
Brown, Spanish.	1 1/2
Brown, Vandyke, Amer.	3
Brown, Vandyke, English.	6
Carmine, No. 40, in bulk.	2.75
Carmine, No. 40, in boxes or barrels.	2.85
Carmine, No. 40, in bottles.	3.75
Chalk, in bulk.	2.25
Chalk, in bbls.	33
China Clay, English.	13.00
Cobalt Oxide, prep'd.	9.00
Cobalt Oxide, black.	1.90
Cobalt Oxide, black.	1.96
Green, Paris, in bulk.	10
Green, Paris, 170 @ 175.	10 1/2
Green, Paris, small pack.	12
Green, Chrome, ordinary.	6
Green, Chrome, pure.	22
Lead, Eng. B.B. white.	8 1/2
Lead, Ann. White, dry or in oil.	7
Kegs, lots less than 500.	6 1/2
Kegs, lots 500 to 5 tons.	6 1/2
Kegs, lots 5 tons to 15 tons.	6 1/2
Kegs, lots 15 tons and over.	6 1/2
Lead, White, in oil, 25 @ 2 tin pails, add to keg price.	1
Lead, White, in oil, 12 1/2 @ tin pails, add to keg price.	1
Lead, White, in oil, 1 to 5 @ assorted tins, add to keg price.	1
Lead, Red, bbls. and 1/2 bbls.	6
Lead, Red, kegs.	6 1/2
Litharge, kegs.	6 1/2
Litharge, bbls. and 1/2 bbls.	6

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.	
Ocher, Rochelle.	1.35
Ocher, French Washed.	1.40
Ocher, German Washed.	1.40
Ocher, American.	1.40
Orange Mineral, English.	8 1/2
Orange Mineral, French.	10
Orange Mineral, German.	8 1/2
Orange Mineral, American.	8 1/2
Paris White, English Cliff.	1.00
Paris White, American.	85
Red, Indian, English.	5 1/2
Red, Indian, American.	2
Red, Turkey.	9
Red, Tuscan.	9
Red, Venetian, American.	100 lb. 1.00
Red, Venetian, English.	1.20
Sienna, Italian, Burnt and Powd.	4
Sienna, Ital., Burnt Lumps.	1 1/2
Sienna, Ital., Raw, Powd.	4 1/2
Sienna, Ital., Raw, Lumps.	1 1/2
Sienna, American, Raw.	1 1/2
Sienna, American, Burnt and Powdered.	1 1/2
Talc, American.	1 1/2
Terra Alba, Fr'ch. 100 lb.	96
Terra Alba, English.	70
Terra Alba, American No. 1.	65
Terra Alba, American No. 2.	45
Umber, Turkey, Burnt and Powdered.	3 1/2
Umber, Turkey, Raw and Powdered.	3 1/2
Umber, Turkey, R'w Lumps.	2 1/2
Umber, Turkey, R'w Amer.	1 1/2
Umber, Chrome.	1 1/2
Vermilion, American Lead.	11 1/2
Vermilion, Quicksilver, bulk.	57
Vermilion, Quicksilver, bags.	63
Vermilion, Quicksilver sm'r pks.	62
Vermilion, English Import.	85
Vermilion, Imitation, Eng.	8
Vermilion, Trieste.	90
Vermilion, Chinese.	92 1/2
Whiting Common, 100 lb.	37 1/2
Whiting Gliders.	45

Zinc, American, dry.	14 1/2
Zinc, French, Red Seal.	7 1/2
Zinc, French, Green Seal.	9
Zinc, French, V. M. X.	7
Zinc, Antwerp, Red Seal.	7 1/2
Zinc, Antwerp, Green Seal.	7 1/2
Zinc, German, L. Z. O.	9 1/2
Zinc, V. M. in Poppy Oil, 0.	7 1/2
Seal, lots of 1 ton and over.	10 1/2
lots less than one ton.	11
Zinc, V. M. in Poppy Oil, Red Seal.	10
lots of 1 ton and over.	10 1/2
lots less than 1 ton.	10 1/2
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or assorted grades, 15 @ 25 bbls., 3 %; 50 bbls. 4 %. No discount allowed on less than bbl. lots.	
Colors in Oil—	
Black, Drop, Frankfurt.	25
Black, Drop, English.	12
Black, Drop, Domestic.	7
Black, Lampblack, Best.	20
Black, Lampblack, Common.	7
Black, Ivory.	8
Blue, Chinese.	35
Blue, Prussian.	20
Blue, Ultramarine.	13
Brown, Vandyke.	7
Green, Chrome.	8
Green, Paris.	16
Sienna, Raw.	7
Sienna, Burnt.	7
Umber, Raw.	7
Umber, Burnt.	7
Putty—	
In barrels and 1/2 bbls.	.01 1/2
In tubs.	.01 1/2
In tin cans.	.01 1/2
In bladders.	.01 1/2
Spirits Turpentine—	
In regular bbls.	34 1/2
In machine bbls.	35
Glue—	
Low Grade.	8
Cabinet.	12
Medium White.	13
Extra White.	17
French.	10
English.	10
Irish.	12

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